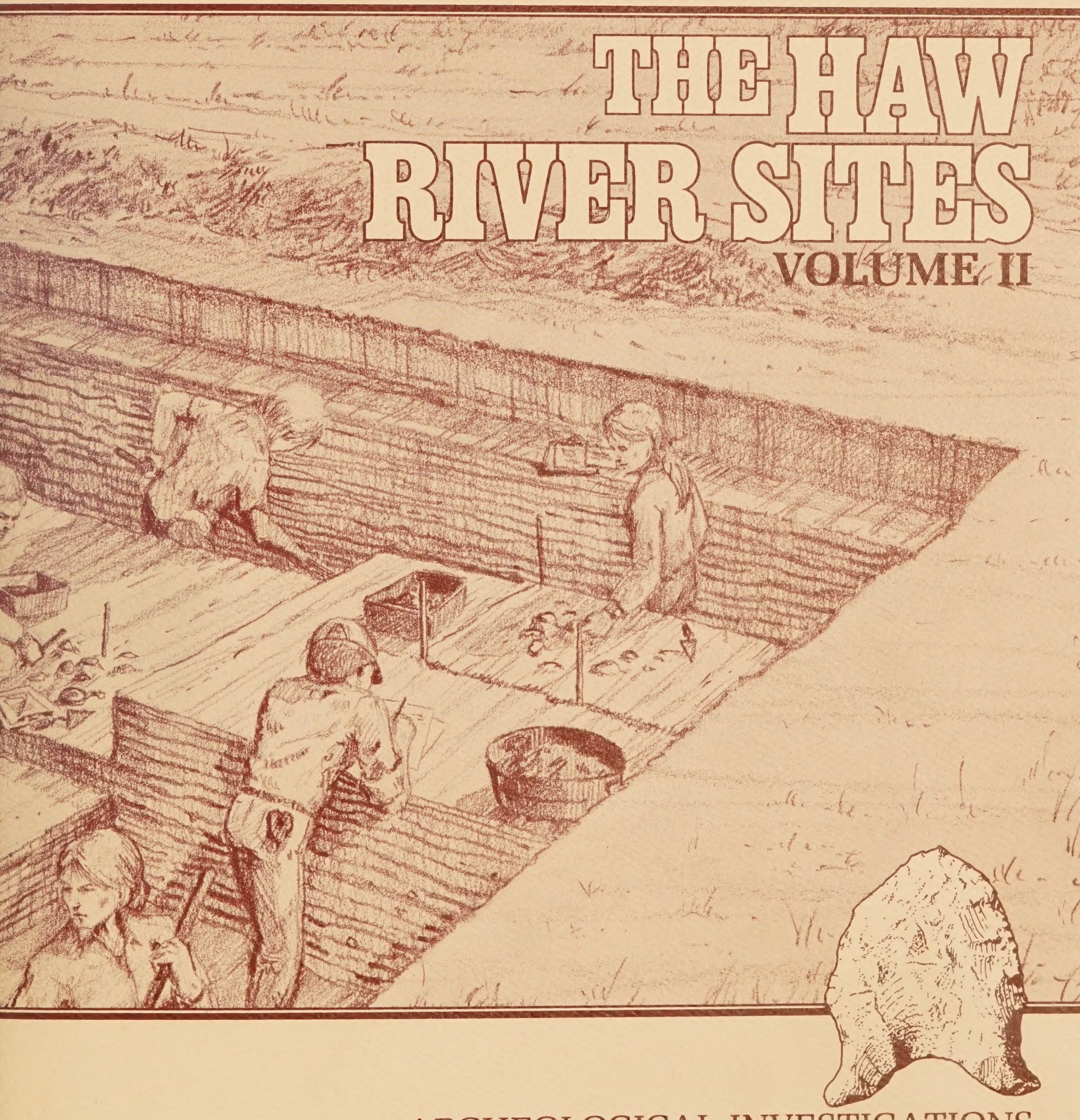
THE HAW RIVER SITES

VOLUME II



ARCHEOLOGICAL INVESTIGATIONS
AT TWO STRATIFIED SITES
IN THE NORTH CAROLINA PIEDMONT

CLAGGETT & CABLE, ASSEMBLERS
COMMONWEALTH ASSOCIATES, INC.

THE HAW RIVER SITES:

ARCHEOLOGICAL INVESTIGATIONS AT TWO STRATIFIED SITES IN THE NORTH CAROLINA PIEDMONT

VOLUME II

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CHAPTER 9
ARCHEOLOGICAL DATA PRESENTATION AND INTERPRETATION

Artifactual material from the block excavations at 31Ch29 (Block A) and 31Ch8 (Blocks B and C) provides the data base for the following assemblage descriptions. Site 31Ch29 is represented by Early and Middle Archaic occupations while material from 31Ch8 is primarily associated with Late Archaic and Woodland occupational episodes. In keeping with the position outlined in Chapter 2, information is organized in two major divisions. First, the assemblage is subdivided into the various cultural-historical phases defined by Coe (1964). Second, the material is further categorized into occupation floors. These occupation floors serve as the basic units of analysis for the study of intra-site structure and assemblage evolution.

DEFINITION OF OCCUPATION FLOORS

Since the concept of occupation floor assumes a pivotal role in the interpretive framework of this report, it is critical to devise an accurate methodology for delineating and distinguishing between superimposed surfaces of occupational debris. For this purpose the structure of the natural stratification of 31Ch29 is considered.

Larsen's (see Chapter 6) sedimentological analysis indicates that the site's stratigraphy is a sequence of discrete graded sand beds deposited as a consequence of episodic flooding of the Haw River throughout the Holocene. Each of these beds is visibly delineated by reddish-brown lamellae or "beta horizons" which are basically illuvial in origin. These lamellae, rather than demarcating the tops of flood deposits as would be expected if they were alluvial in origin, are believed to be a result of natural soil formation processes. Coarser sand grain sizes are associated with the subsoil lamellae. Since coarser grain sizes are expected to occur at the bases of the graded sand beds, it is highly probable that the subsoil lamellae occur at the bases of the bed sequence. This would imply that the reddish-brown lamellae are secondary deposits on top of long exposed surfaces and in a sense "cap" potential occupation floors.

As Larsen recounts, this interpretation was not readily apparent when we began the excavation. Initially we assumed that the lamellae originated as a phenomenon of primary deposition. It followed from this assumption that these "beta horizons" represented fine silt deposits demarcating the last flooding episodes. Consequently, we fully anticipated that the tops of the lamellae would have provided the surface on which prehistoric occupations of the site would have occurred.

Through the course of the excavation, however, we were repeatedly confronted with an enigma which seemed to contradict a primary depositional origin for the lamellae. Clay

residue from the lamellae was commonly observed on the reverse (upper) side of artifacts, especially large artifacts. This was contrary to the expected case if artifacts had been deposited on the surfaces of clay-rich lamellae, and suggested that a large proportion of the artifactual material was occurring just *under* the lamellae.

Sufficiently confused by this anomaly, we decided to examine more closely the structure of this relationship. For this purpose we selected three 3 x 3 meter Excavation Units (9, 10, 11) which were excavated in natural levels rather than the original method of arbitrary levels. Lamellae and inter-lamellar sand beds were each numbered and excavated with trowels. Artifacts were piece-plotted and assigned to either a sand or lamella level depending upon their association.

Natural level excavation confirmed that the greatest concentrations of artifactual materials and the largest sized artifacts were "in" the lamellae or very near them (refer to Figures 9.1 and 9.2). However, when a lamellar surface was exposed, it appeared that artifacts were extending up through it, as opposed to resting on it, contradicting our original interpretation of the natural site formation processes. Our observations concerning the reverse position of clay residue on artifacts encountered during arbitrary level excavation took on added meaning. It actually appeared as if the lamellae were on top of the concentrations of occupation debris.

Larsen's hypothesis is that illuvial clays were developed by pedogenesis on the stabilized surface of the terrace (perhaps in late Holocene times). There is no real evidence to indicate that there were separate periods of pedogenesis.

If Larsen's alternative or working hypothesis (which states that the lamellae are illuvial in origin and have formed at the bases of graded beds) is an accurate reflection of the pedogenic and depositional history of the site, then the natural level excavation data should provide an independent test of his interpretations. Before consulting the natural level information, though, it would be useful to construct an idealized model of the structure of archeological occupation floors in relation to the working hypothesis. Initially, if the lamellae are post-depositional pedogenic phenomena, then they formed after the original flood sediments were deposited. Additionally, if these lamellae form at the base of each graded bed, as Larsen's analysis strongly suggests, then a lamella demarcates a deposit covering an occupation surface or a surface that was exposed to subaerial processes for a long period of time. The lamellae indicate the deposits of the next flood event which left its sediment load, and subsided. Thus, occupation floors would have been formed independently of the lamellae and should exhibit a degree of independence from these clay "caps."

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FIGURE 9.1
NATURAL LEVEL EXCAVATION-

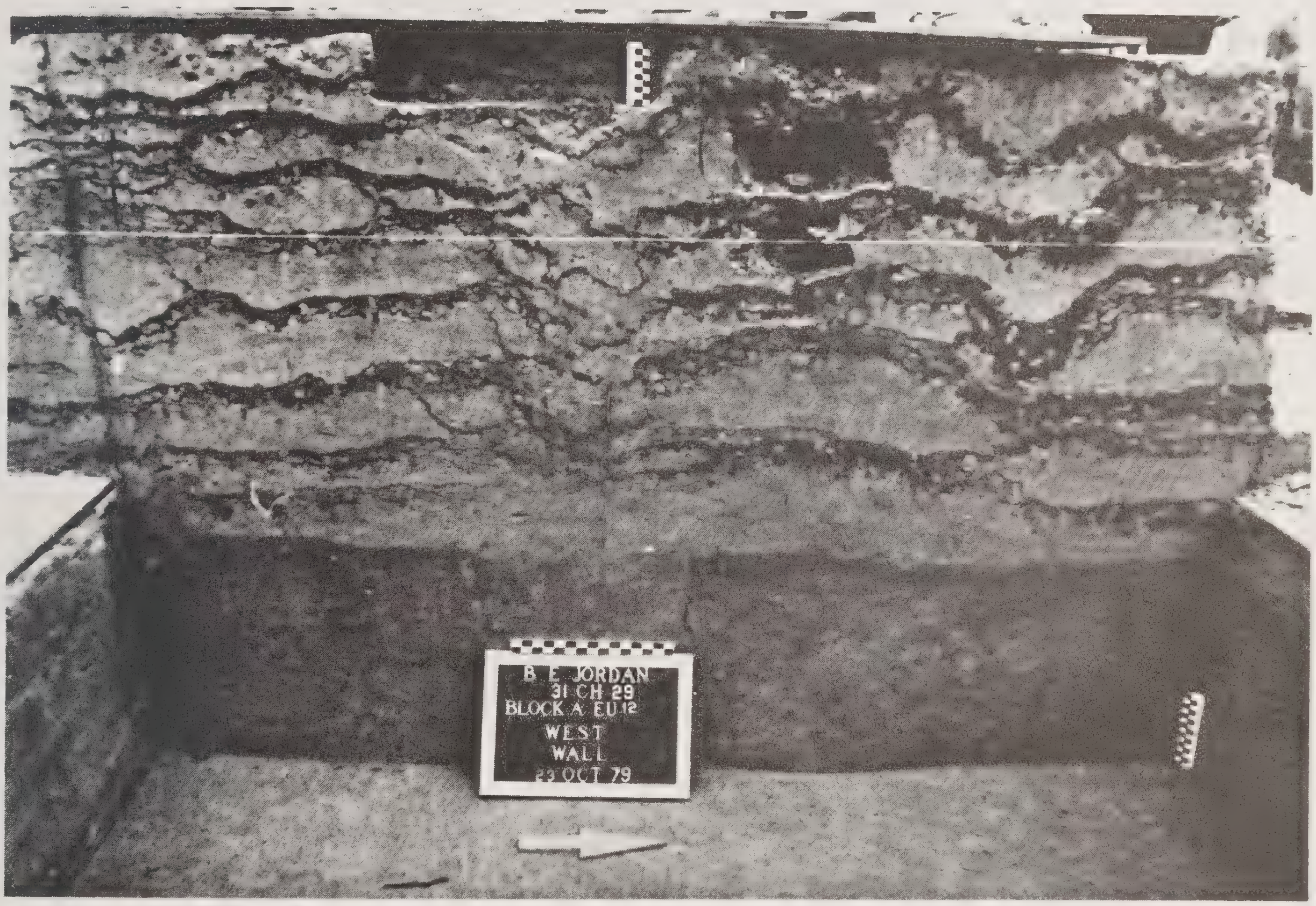

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FIGURE 9.2
WEST WALL PROFILE-

Setting aside for the moment postdepositional biogenic perturbations or pedoturbations (see Wood and Johnson 1978) and cultural disturbances such as possible pit excavations (see Larsen, Chapter 6), artifacts occurring on a single, long-exposed surface should exhibit variable relationships to lamellae according to the degree to which they were forced into the sandy matrix of the site by the human occupants of a surface. It is reasonable to expect that vertical displacement of artifactual debris will increase with a single occupation span and the degree to which the surface was reoccupied. Thus, there should be a closer relationship between artifacts and lamellae where the space was occupied for a very short time and/or where the frequency of reoccupation was low. Artifacts which have experienced very little vertical displacement should occupy a stratigraphic position *within* a lamella or at the lower *interface* of a sand bed and its associated lamella. These artifacts should exhibit clay residue from this lamellar association. Large artifacts most typically should bear clay residue at one end or on their upper surfaces depending upon individual angles relative to the horizontal.

By contrast, artifactual material that has been displaced appreciably downward prior to the formation of the lamella associated with its occupation surface should bear only sand. These artifacts should be positioned at variable depths within an inter-lamellary sand bed and should not exhibit clay residues on their surfaces. On the other hand, artifacts which have been displaced downward due to pedoturbation reflect a partially different pattern. Pedoturbation (see Buol et al. 1973:89,94 and Wood and Johnson 1978:317) is a term commonly used by soil scientists to refer to the biological, chemical, or physical processes of churning or mixing of soil materials. These processes can result in horizontal as well as vertical displacement, but it is the vertical movement of artifacts which most concerns us here. The major observable disturbance of this type at the site was root movement by woody plants. A view of any exposed lamellar surface from the natural level excavations (see Figure 9.1) revealed profuse small holes where roots had penetrated the "clay caps" on their downward growth pathways. A consequence of this process would be to dislodge artifacts interfaced with lamellae and displace them downward into the inter-lamellar sand beds. This expectation was verified in a number of instances during the course of the natural level excavations. Even though our perceptions of the natural formation processes had not yet coalesced into Larsen's working hypothesis, we had surmised this pattern was possibly due to root disturbance.

Another major definable disturbance was an apparent pit excavation by site occupants of the Morrow Mountain cultural-historical period which Larsen (Chapter 6) surmises was due to attempts to scavenge lithic artifactual materials from earlier periods. This disturbance was limited to squares e, f, h, and i of Excavation Unit 1 and squares b and c of Excavation Unit 5 in Block A. The excavation extended downward into the Kirk occupations in this area, but ends before the Palmer occupations. The pit was filled with an abundance of debitage composed of a raw material type common to the Morrow Mountain occupations at the site. Two Morrow Mountain points were found in the fill of the pit as well. Whatever the purposes of the pit were, it appears that it was filled by either a cultural

or natural process with soil from the Middle Archaic occupation surfaces. The only other disturbance causing mixing of later artifactual materials with earlier occupation surfaces was in Excavation Unit 2 (squares a and f and possibly b and c) where a Bifurcate and a Stanly point were found in association with a Palmer occupation floor.

The final major observable pedoturbation concerns the warping which occurs in the lamellae at various areas of the site. Photographs of the west wall profile of Excavation Unit 12 (Figure 9.2) and the north wall profile of Excavation Unit 2 (Figure 9.3) illustrate extreme and mild examples of this phenomenon, respectively. Although there are many things about the formation processes of the lamellae which are not well understood, it is possible to suggest that this warping may also reflect various freeze-thaw phenomena (cf. Wood and Johnson 1978).

If the observed warping of the lamellae is a function of some kind of freeze-thaw process, then artifacts from occupation floors could be subjected to localized movements. However, if displacement was due to such causes, upward movements occurred *en mass* and it would not seem that the basic relationship between the post-depositional subsoil lamellae and inter-lamellary bands is significantly affected by such a process. If we were to use exclusively arbitrary level data to determine our occupation floors, though, it should be appreciated that we would unavoidably mix discrete occupational events.

An additional methodological problem presented by these apparent involutions concerns the occasional blending of lamellae. Examination of the west profile of Excavation Unit 12 illustrates this point (see Figure 9.2). This phenomenon appears primarily in the early Holocene lamellae. One explanation might be that the moister and colder conditions of that time interval created a situation of greater saturation, increasing the area of frozen soil. This in turn might create greater pressures during the spring thaw resulting in more extreme eruptions into the frozen layer above. As a consequence, lamellae would tend to blend together in areas of structural weakness. The area of extreme blending occurs primarily in the lower levels of Excavation Units 8 and 12 and the eastern sides of Excavation Units 7 and 11. The remaining units exhibit only moderate to light warping, and blending is minimal.

One more topic must be considered before proceeding to a construction of an idealized model for identifying occupation floors: the problem of mixing between superimposed occupation floors. To our knowledge there are no published ethnoarcheological studies dealing with the quantitative description of the mechanics and distribution of occupational floors which would provide objective principles for distinguishing between superimposed occupations. Our knowledge of occupation floors must at present derive almost solely from archeological information. Archeological studies dealing with the spatial analysis of occupation floors rarely present detailed discussions of the methodology used to define

these floors (e.g., Schiffer 1974 and 1976; Price et al. 1974; Whallon 1974; Freeman 1973). Schiffer's (1974) treatment of the concept of occupation floor manages to avoid this issue as well. There is a tremendous effort devoted to justifying interpretations of horizontal patterning, but we are forced to accept, almost at face value, that the collection of debris used in a spatial analysis is somehow functionally related.

Perhaps the best archeological description of the character of occupation floors comes from the Havelte Project, Drenthe Province, Netherlands (Price et al. 1974:24). The authors indicate that the greatest concentration of artifacts associated with their Mesolithic occupation floors usually occurs within a relatively shallow zone of 5 to 10cm in thickness. The vertical distribution, however, can range up to 25cm in extreme cases. Examination of the relationship between artifacts to the meaningful soil horizon (B_2B), analysis of the possibilities of reoccupation or disturbance, and the search for unobserved features required "backplots" of the vertical distribution of artifacts which were constructed for each 20cm wide strip across the excavation. The backplots demonstrated that the degree of vertical dispersal at any point within an occupation floor was related to artifact density. Where artifact density was low, vertical dispersal was also low, being distributed within a very narrow band believed to correspond to the original living surface. In areas of greater artifact density, vertical dispersion also increased.

This description is probably an accurate estimate of the vertical displacement of artifacts comprising occupation floors at 31Ch29. Unlike the Havelte Project, though, we must consider methods for distinguishing between debris from superimposed occupations. "De Doeze," the Havelte Site, contains a virtually pure Mesolithic occupation history confined to a thin soil horizon (principally B_2B). The refitting or reassembling of cores from the debris of the occupation suggest that much of the site is organized into discrete clusters of activity so that the level of overlap due to Mesolithic reoccupation is probably minimal. By contrast, 31Ch29 contains a 10,000 year history of reoccupation which, had it been confined to a single thin soil horizon, would present a virtually uninterpretable jumble of overlapping occupations. Fortunately, the periodic flooding of the Haw River provided the necessary conditions to achieve a degree of vertical separation between occupation floors. A general perusal of the wall profiles (see Figure 9.2) will indicate that the lamellae are only spaced between 5 and 10cm apart, on the average. If these features demarcate occupation floors, then we must contend with the possibility of some vertical overlap of debris given the Price (et al. 1974:24) observations concerning vertical dispersal.

Given these considerations it is possible to construct a hypothetical model floor for 31Ch29 relative to features of the natural stratigraphy. Figure 9.4 illustrates salient aspects of the model. Three lamellae are illustrated, representing the tops of three superimposed occupation floors. Each lamella and its underlying sand bed defines an occupation floor.

Previously described stratigraphic relationships between soil zones and artifacts include:

1) artifacts with little vertical displacement by human or natural agents, and bearing clay residues (A, B, C);

2) items in interlamellar (sand) contexts which may or may not exhibit clay deposits on their surfaces (D);

3) artifacts displaced by roots or other biological forces subsequent to lamellae formation, which bear clay coatings (E, F);

4) artifact clusters ("features") containing large items which appear to protrude through lamella. Rock clusters at the base of graded beds (G) are mantled by the clay-rich lamellae, while those disturbed by roots or humans (H, I, J) are scattered within and between several occupation zones. The latter disturbance process corresponds to the "size effect" phenomenon discussed by Baker and Schiffer (1975:177-122).

Recourse to actual archeological examples further illustrate this idealized model. Figures 9.5 through 9.8 are diagrammatic profiles of piece-plotted information from Excavation Unit 9. The profiles illustrate the position of artifactual material relative to four lamellae (arbitrarily designated 3, 5, 7 and 9 in the field). Profiles 2 through 6 demonstrate the integrity of the lamellae based on cultural-historical projectile point styles. Lamella 3 is associated with Morrow Mountain occupation. Lamella 5 is identified with a Stanly occupation, while lamellae 7 and 9 contain Kirk diagnostics. It should be noted that the formation processes of the site would not preclude the possibility of different cultural-historical occupations on one surface since these surfaces appear to have been exposed for long periods of time. The presence of 11 or 12 lamellae between the Morrow Mountain occupations at the site and the basal terrace containing evidence of a Hardaway-Dalton occupation suggests that these surfaces may have been exposed for an average of 350 to 400 years before the next major flooding. The large number of lamellae (6) associated with the Hardaway-Dalton, Palmer and Kirk Corner-notched occupations might indicate shorter periods of exposure during the early Holocene compared to the Middle Holocene.

Other relationships which can be observed from the natural level excavations are:

1. Tools exhibit a tendency to be closely associated with lamellae. While this is not always true, it is a significant trend.

2. Flakes are more diffuse in their distribution. This would correspond to the observation of Price (et al. 1974:24) that vertical dispersal increases as artifact density increases. Chipping stations would tend to reflect such a pattern.

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FIGURE 9.3
NORTH WALL PROFILE-

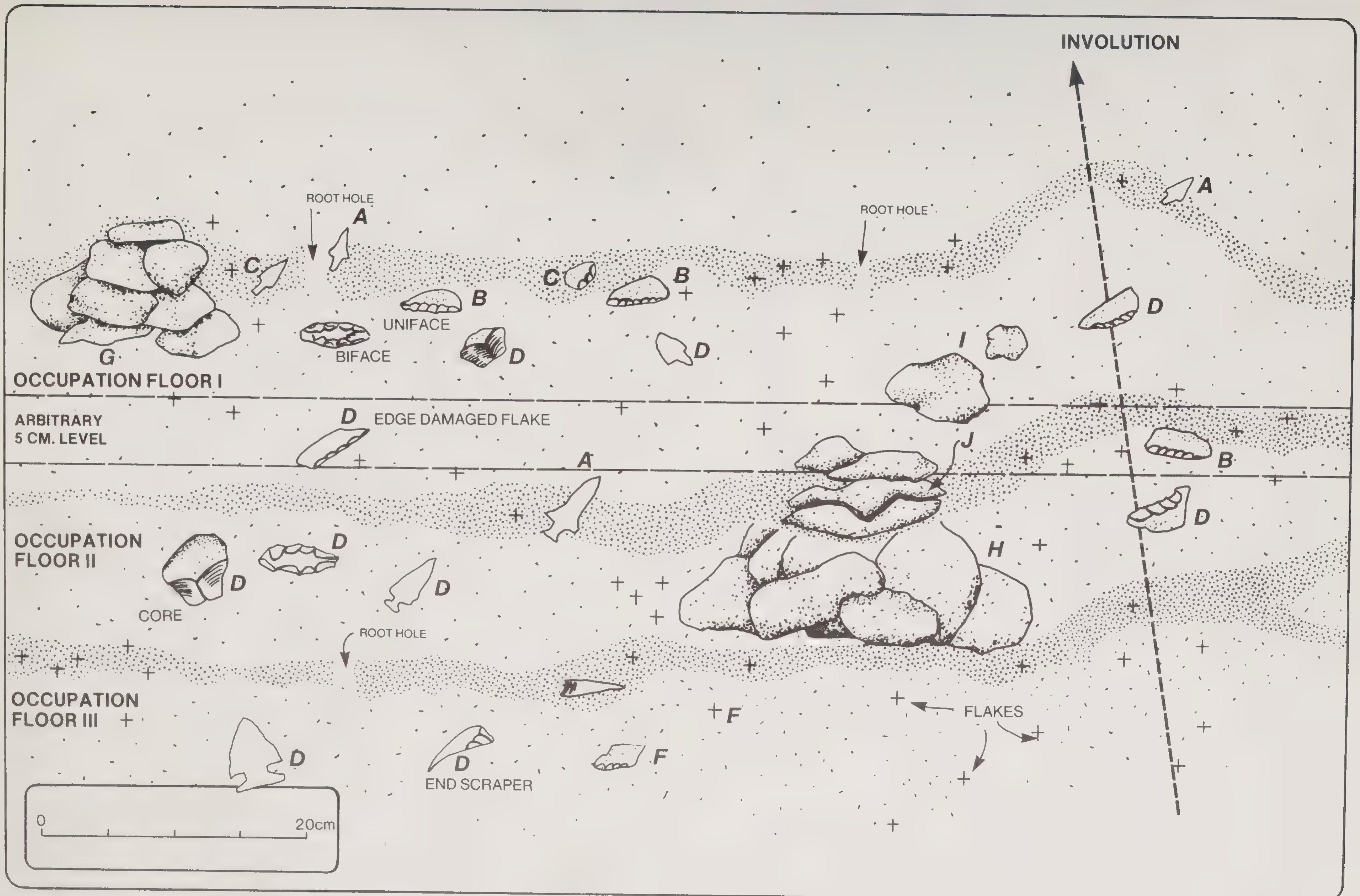

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FIGURE 9.4
OCCUPATION FLOOR STRUCTURE
(HYPOTETICAL MODEL)

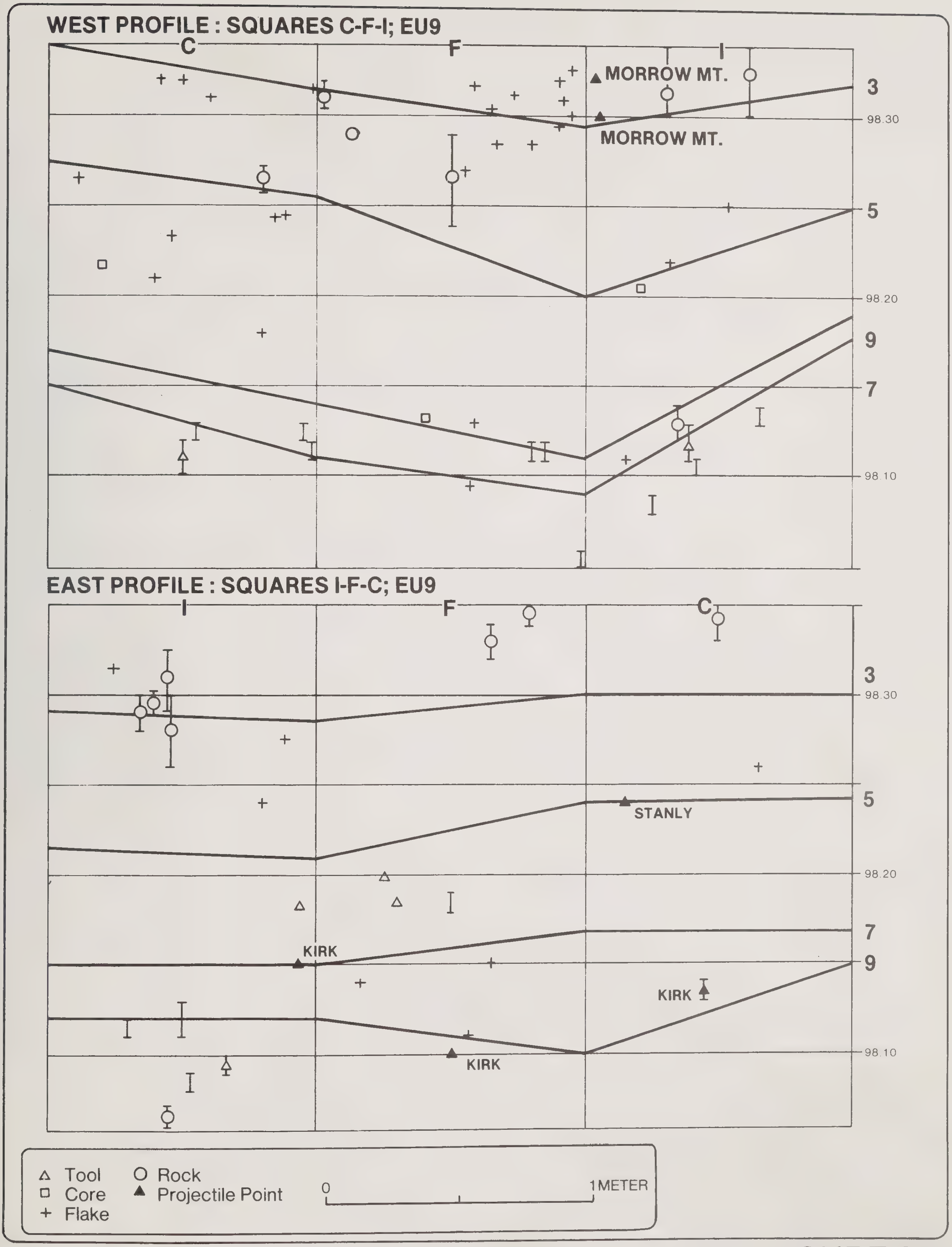

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FIGURE 9.5
NATURAL LEVEL EXCAVATION-
31CH29-BLOCK A-EU9

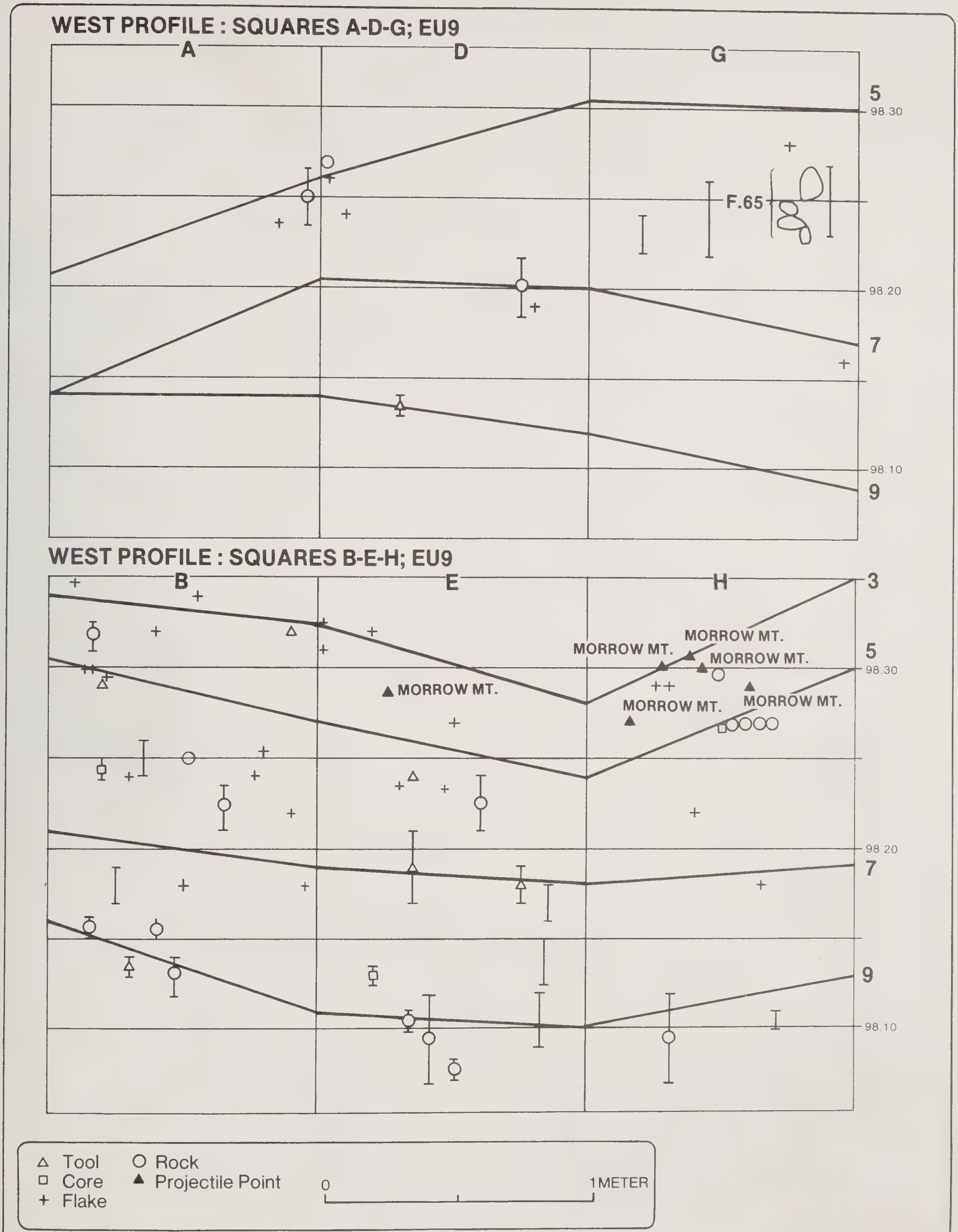

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FIGURE 9.6
NATURAL LEVEL EXCAVATION-
31CH29-BLOCK A-EU9

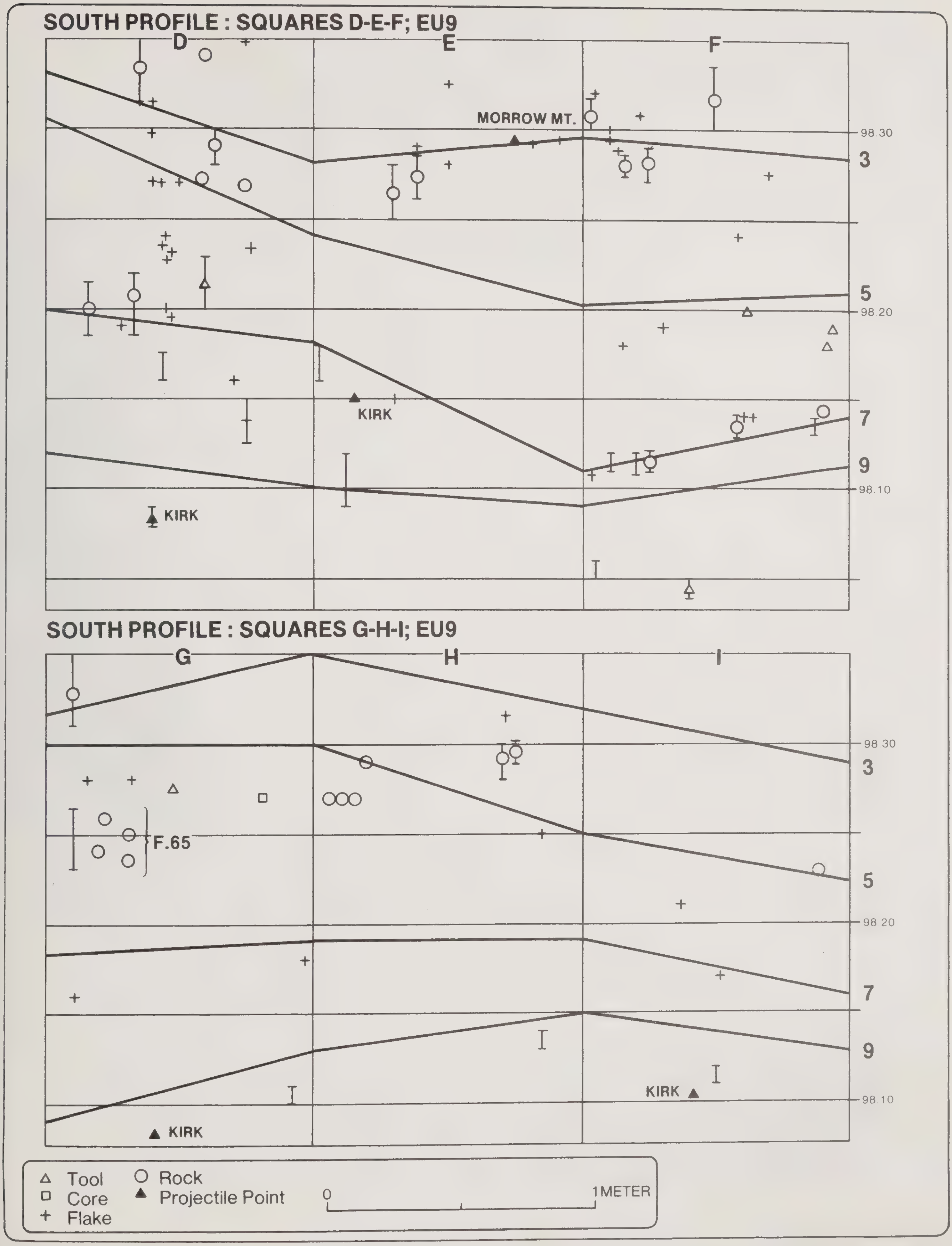

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FIGURE 9.7
NATURAL LEVEL EXCAVATION-
31CH29-BLOCK A-EU9

3. Large hearth rocks appear to cut through lamellae and at times exhibit random inter-lamellar sand bed contexts which might relate to the "size effect" concept (Baker and Schiffer 1975:117-122).

4. At times one lamella will closely approach another, indicating some potential for mixing between occupation floors (observe profiles 1, 3, 7 and 8 especially). This may result from soil involution due to various pedoturbation or bioturbation phenomena (Wood and Johnson 1978: 359-62).

Based on the correspondence between the model and results from the natural level excavations, we feel confident in applying the model to define occupation floors at the site. There are certain identified problems in its application, such as the inability to detect pre-lamella formation mixing, but this should be minimized by field recording techniques used at the Haw River sites. Bifurcation or blending of lamellae presented a situation where mixing of artifacts could occur. However, that circumstance was considered significant only where dense concentrations of artifacts belonging to two adjacent floors coincided.

Since the great majority of units in the block were excavated in arbitrary levels, it was necessary to correlate the provenience information with the natural stratigraphy of the site to derive occupation floors. This was accomplished by transposing the vertical and horizontal proveniences onto unit stratigraphic profiles drawn in the field. In cases where more than one profile was available per excavation unit, artifacts were plotted on the nearest profile. A total of 21 different profiles were utilized for the Block A correlations. It was important to achieve as much detail as possible to plot the artifacts since the vagaries of the lamellae were so great. Both straight slants and involutions could cause vertical discrepancies in the location of an occupation floor relative to the horizontal. Through the course of the excavation it was standard practice to piece-plot all tools and large pieces of debitage encountered during shovel skimming. Also, several levels from certain excavation units were selected for more detailed piece-plotting as well. This information was of great value in defining occupation floors. Artifacts located only within a general level within a 1m x 1m square took on an ambiguous association relative to a discrete floor; those artifacts were removed from the general analysis and placed in an unconfirmed grouping between adjacent floors. These artifacts are discussed in the assemblage descriptions but are omitted from the later spatial analysis. Whallon (personal communication, 1981) believes this is an acceptable practice in spatial analysis which will not appreciably affect the results if the number of unconfirmed items is small.

Figure 9.9 (north wall profile) illustrates the general results of the transposed artifact proveniences. Artifact locations are relative to the arbitrary or natural level system explained in Chapter 4. Lamellae sometimes bifurcated and blended back into a single band. This necessitated a rather complex numbering system for these lamellae which involved assigning primes (e.g., ', ", ''') to bifurcations. The lower lamella in a bifurcation would

retain its originally assigned number while the upper arm would receive a priming value to distinguish it from the sequence of original lamellae defined in EU3. For an example of this procedure, consider the case of lamella 14 which underwent three bifurcations in the profiles. The first bifurcation resulted in an upper lamella designated 14′. This lamella bifurcated into 14′ and 14″ after which 14″ bifurcated into 14″ and 14‴. Blending resulted in combination designations (e.g., 14′/13/13′, etc.). Bifurcations characteristically were associated with sterile or nearly sterile artifactual contents so that they posed very few problems in defining floors.

From the procedure outlined above, the following occupation floors were defined at Block A, 31Ch29:

Lamella	Occupation Floor Designation
16	Hardaway-Dalton
15	Palmer I
13/14	Palmer II
11/12	Palmer III (or Kirk Corner-notched)
9/10	Kirk I
8	Kirk/St. Albans
7/6	LeCroy/Kirk II/Stanly
5/4	Stanly/Morrow Mountain
3	Morrow Mountain Stemmed
2	Morrow Mountain/Halifax/Savannah River
1	Mixed Archaic/Woodland

Those stratigraphic units will be employed to organize description and analysis of artifacts from 31Ch29 in the following pages. Sequential presentation of Archaic assemblages from the oldest (Hardaway-Dalton) to most recent (Savannah River) occupations revealed in our excavations facilitates stylistic and functional comparisons between elements of separate assemblages. Additional, and very important discussions are included which contrast artifacts from other Archaic stage sites elsewhere in the Southeast. Certain technological aspects of the assemblages were outlined earlier, and will also be integrated with the following discussions.

The artifact data are further arranged according to certain analysis goals presented in Chapter 4. In essence, since we are interested in examining differential patterns of technological organization through time, according to theoretical models posed by Binford, our assemblage descriptions adhere to relevant formal and functional categories. As outlined in Chapter 4 and in keeping with stated objectives of defining mobility patterns as reflected in archeological data, the following presentation incorporates a tripartite typological scheme of personal gear, situational gear and site furniture (Binford 1976, 1978a). The assemblages

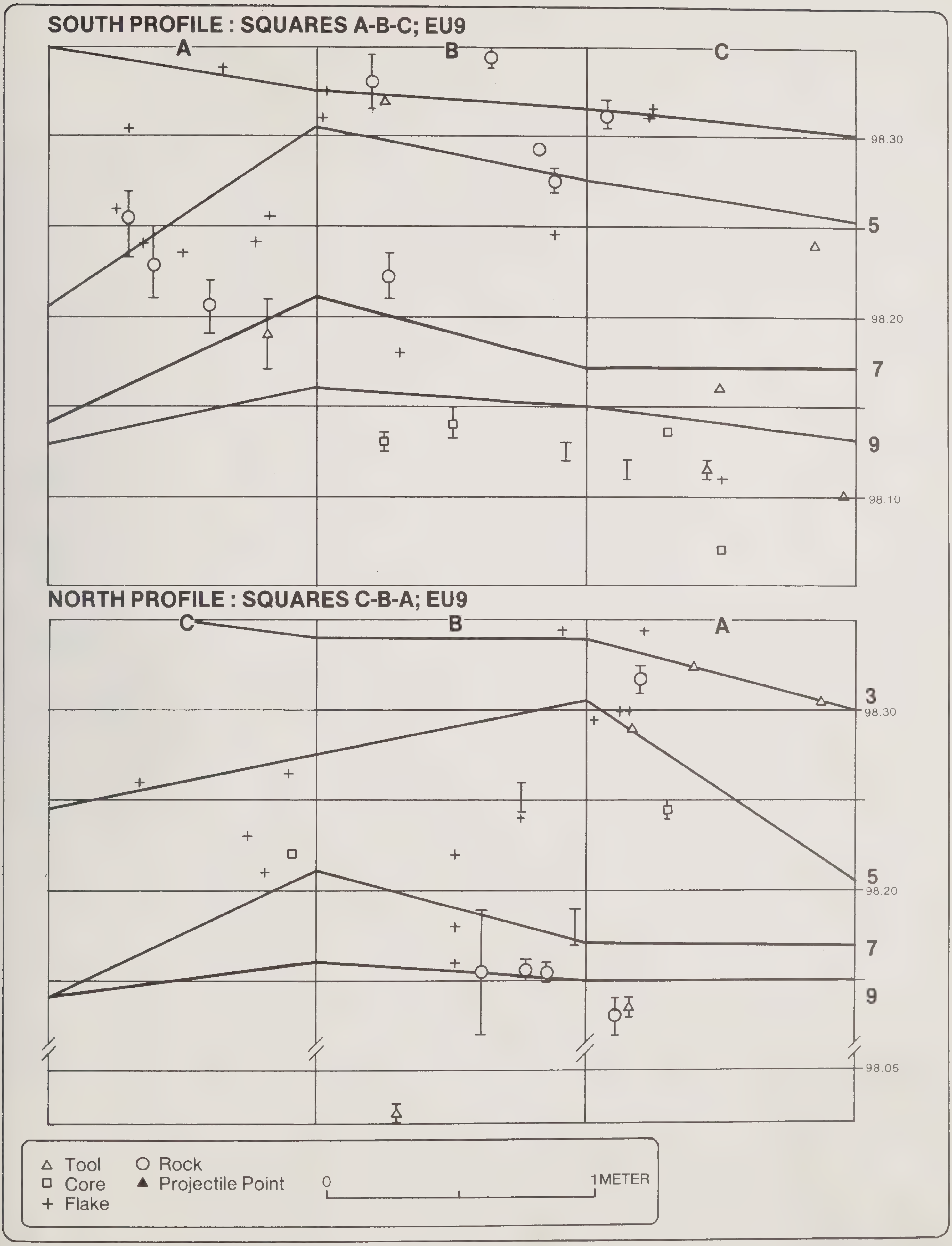

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FIGURE 9.8
NATURAL LEVEL EXCAVATION -
31CH29-BLOCK A-EU9

retain its originally assigned number while the upper arm would receive a priming value to distinguish it from the sequence of original lamellae defined in EU3. For an example of this procedure, consider the case of lamella 14 which underwent three bifurcations in the profiles. The first bifurcation resulted in an upper lamella designated 14′. This lamella bifurcated into 14′ and 14″ after which 14″ bifurcated into 14″ and 14‴. Blending resulted in combination designations (e.g., 14′/13/13′, etc.). Bifurcations characteristically were associated with sterile or nearly sterile artifactual contents so that they posed very few problems in defining floors.

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3	Morrow Mountain Stemmed
2	Morrow Mountain/Halifax/Savannah River
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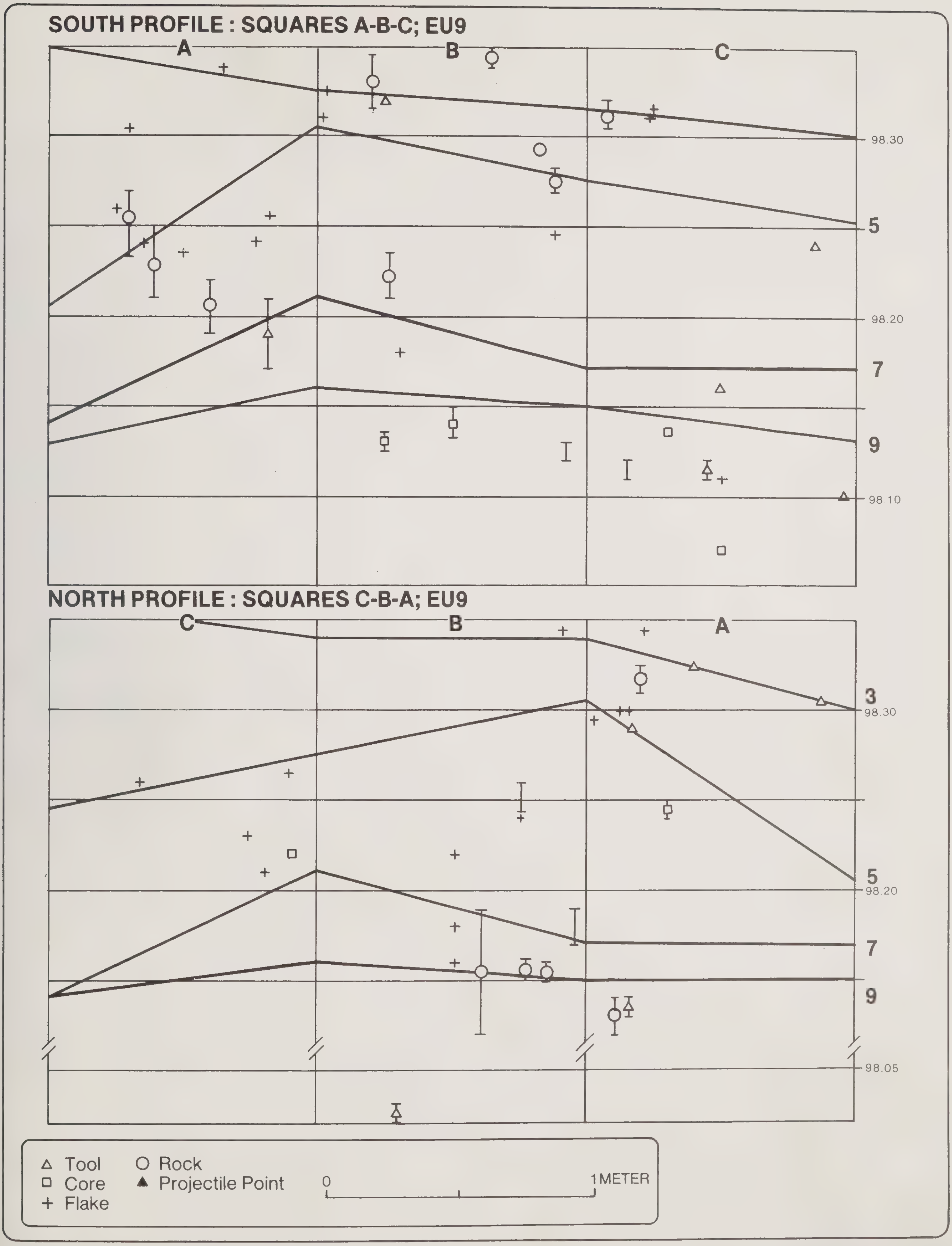

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FIGURE 9.8
NATURAL LEVEL EXCAVATION - 31CH29-BLOCK A-EU9

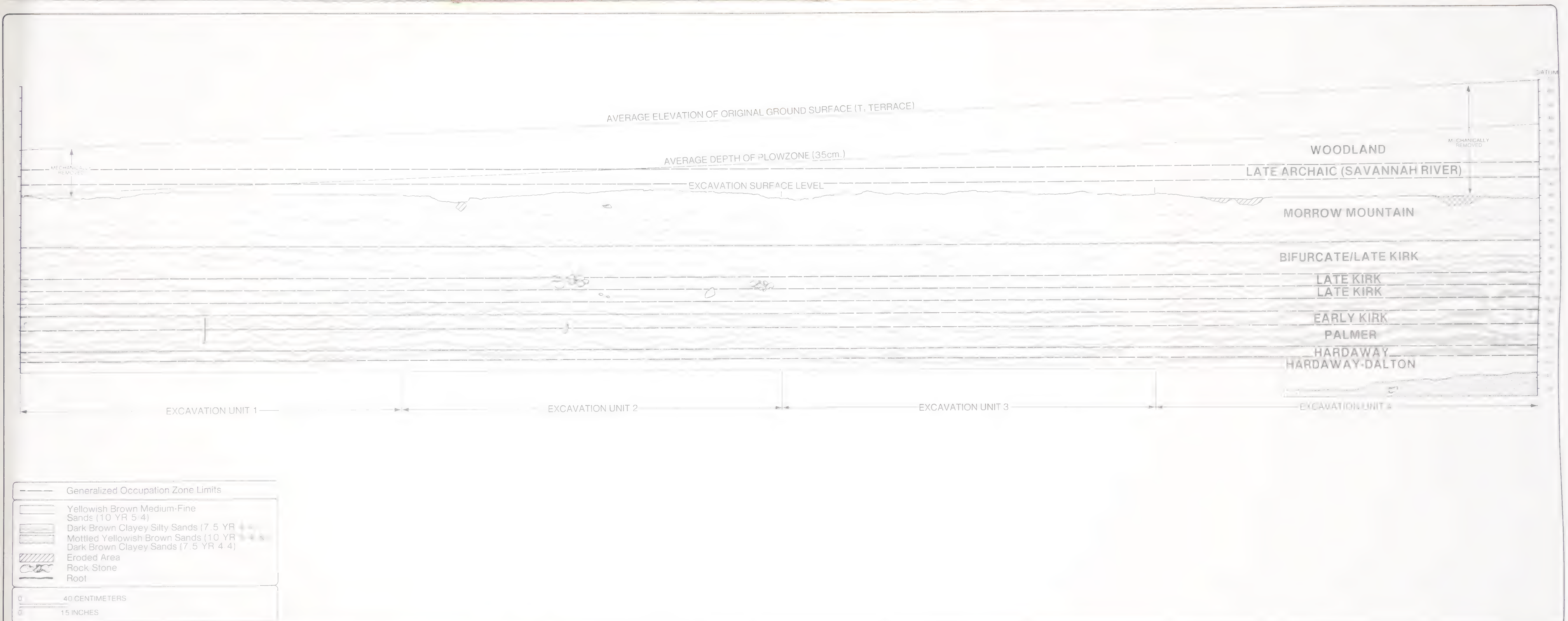

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FIGURE 9.9
GENERALIZED OCCUPATION ZONES
31CH29-BLOCK A-NORTH WALL

recovered from 31Ch8 are presented in similar fashion, within limits imposed by factors of natural and cultural stratification processes at that site, which are explored in the pertinent chapter section.

LITHIC ASSEMBLAGE ANALYSIS – 31Ch29, BLOCK A

Lamella 16 – Hardaway-Dalton Occupation Floor

The Hardaway-Dalton occupation at 31Ch29 is limited to a single floor defined by lamella 16 and its associated inter-lamellar sand bed. At the lower extremity, the floor is bounded by the Pleistocene erosional surface underlying the T_1 alluvial sands. Tools are confined to the sands above the terrace, but selected excavation into the underlying clays produced sporadic chipping debris which might be associated with this floor or possibly earlier occupations. Debitage intrusion into those deposits was judged to be a fortuitous occurence, similar to the cultural materials in otherwise sterile deposits as noted by Coe (1964:67) at the Hardaway site.

I. Personal Gear from this floor consists of the following classes of tools: 1) Projectile Points; 2) Unifacial Adz; 3) Endscrapers and 4) Flake Blanks.

Projectile Points: Two projectile points are associated with this floor, both corresponding to Coe's (1964:57) Hardaway-Dalton type description (see Plate 3):

> A broad, thin blade with deeply concave bases and shallow side-notches. Bases and side-notches were ground and edges were frequently serrated.

Specimen 3·7-8·30·1 is manufactured from a light green latite felsite (Raw Material C). The blade is broad and the edges are excurvate. Serration is absent. Blade resharpening was accomplished through a bifacial retouch strategy. Retouch scars are primarily conchoidal in shape and are stepped along one side. The edge is relatively sharp and exhibits only slight dulling on remnant portions of the edge unaffected by the last resharpening episode. The tip is apiculate in form and exhibits slight edge dulling as well.

The base is highly concave with a large conchoidal thinning flake extending approximately 1/3 of the way up the blade on both sides. Maximum length and width measurements for the basal thinning flakes are 16mm by 17mm and 18mm by 18mm respectively for the two sides. The edge of the basal concavity does not show evidence of grinding. The presence of heavy grinding on the edges of the basal ears, however, suggests that basal thinning may have been an ongoing maintenance activity on Hardaway-Dalton points. The edges of the broad, shallow side-notches are also heavily ground.

Specimen 16·1·32·1 is manufactured from a black devitrified latite porphyry (Raw Material E). Like the other specimen, the blade is excurvate and was resharpened with an

even bifacial retouch strategy. Serration is again absent. Retouch scars are lamellar in form, extending approximately 2 to 6mm onto the face of the blade. The blade edges exhibit a slight, even dulling over most of their circumference. The very distal end of the tip has been removed. A thin, long (20mm in length) fracture scar extending from the area of the missing tip onto one side of the blade suggests that the tip was removed as a consequence of pressure slowly applied to one side or as a result of impact.

The base is deeply concave and is the origin of large conchoidal thinning flakes on either side of the blade (18mm in length and width on one side; 15mm in length and width on the other). Neither the basal concavity nor its edges exhibit grinding. The side-notches, on the other hand, are slightly ground. The differences in the degree of grinding in the specimens may simply result from variability in raw material hardness. Specimen 16·1·32·1 is substantially harder than the other specimen.

Metric and edge angle data on the Hardaway-Dalton points are presented below. Summary statistics are not provided due to the low number of cases. The procedure of measurement for these variables is illustrated in Appendix 2.

Specimen No.	Max. Thickness	Max. Thickness-2	Basal Width	Tang Width	Shoulder Width	Blade Width 2	Axial Length	Tang Length	Blade Length	Notch Length	Angle 11	Angle 12	Angle 13	Angle 21	Angle 22	Angle 23	Tip Angle
16·1·32·1	10	10	31	29	32	28	49	18	30	18	60	50	48	46	41	37	77
3·7·8·30·1	07	07	38	34	36	34	46	19	27	00	54	49	49	65	61	40	84

The term projectile point implies that this class of artifacts was used as a spear or dart point. However, Ahler (1971) demonstrated that wear on projectile points evidences several other uses such as cutting and scraping. Based on a series of technofunctional characteristics Goodyear (1974:32) argues that Arkansas Dalton points were primarily used as knives to butcher large game (principally deer). The following characteristics were noted by Morse (1971):

1) *Resharpening Pattern*: Morse (1971:10 and 28) contends that the use of bevelling and serration as a maintenance strategy is an attempt to conserve the edge of the point to perform various steps in deer butchering and meat processing including the grooving and snapping of the foreleg bone.

2) *Ground Haft*: Dulling of the edges of the haft element would offset severe stresses placed on a hafted knife during butchering by preventing the cutting of its vegetable or sinew bindings (Morse 1971:32).

3) *Deep Basal Concavity*: In conjunction with the ears, the basal concavity would serve to stabilize the point in its haft (Morse 1971:32).

4) Morse (1971:33) also surmises that if Dalton points were hafted in foreshafts they could serve both as a knife and as a dart or spear point.

The dynamics of maintenance on Hardaway-Dalton points appear to be somewhat different than those described for the Arkansas Dalton. Coe (1964:64) reports that only two of the twenty Hardaway-Dalton points at the Hardaway site were oppositely bevelled. Serration, although it occurs on several points from the Hardaway site (Coe 1964:64-66), does not seem to be prevalent either. However, edge dulling wear on the blade and haft grinding appear to be diagnostic of these latter forms and suggest that the Hardaway-Dalton was primarily used as a butchering tool. The apiculated tip on specimen 3·7-8·30·1 at 31Ch29 suggests that tips may have been purposefully maintained, perhaps for hide perforating.

Unifacial Adz: Although the typical bifacially worked Dalton adz described by Morse and Goodyear (1973) is missing from this Hardaway-Dalton floor, an example of a unifacial adz is present (13·6·34·1). This tool is distinguished from the formal characteristics of an ax by its asymmetrical longitudinal and transverse section views (Semenov 1964:126).

The adz was manufactured from a large (113mm long x 54mm wide x 21mm thick, 132 grams) triangular primary flake of a green flow-banded latite porphyry (Raw Material Type A). The lateral margins have been shaped by the unifacial removal of both primary and secondary retouch flakes which extend 1/4 to 1/3 of the distance across the dorsal face of the flake. Unlike the Dalton Adze, the margins were not ground and do not exhibit a glossy polish. The transverse working edge (or bit) exhibits a similar unifacial retouch, consisting of five primary retouch scars (primary scars exceed 10mm in both length and width, secondary scars exceed 5mm in at least one dimension). Retouch extends approximately 20mm onto the dorsal face. The bit exhibits a typical gouge-like outline. The average edge angle across the bit is 57°. Unlike the Dalton Adz, the transverse edge lacks macroscopic evidence of polish on either side.

Endscrapers: Seven endscrapers were recovered from the Hardaway-Dalton floor (see Plate 1). This class exhibits a high degree of morphological variability. Only three of these (13·2·32·1, 12·7·31·1, and 2·5·33·1) could be considered typical of Coe's (1964:73-76) Type I endscraper. All three specimens are made from highly isotropic raw materials: 13·2·32·1 from a dark gray flow-banded latite; 12·7·31·1 from a homogeneous, black devitrified tuff; and 2·5·33·1 from a devitrified latite felsite. The lateral margins of the specimens have been trimmed by fine conchoidal marginal retouch. The left lateral margin of specimen 13·2·32·1 has been modified by fine, bifacial marginal retouch to create a cutting edge. Dulling, presumably from wear, occurs evenly along this edge, extending onto the ridges of the retouch scars of both ventral and dorsal surfaces of the flake for approximately 1 to

2mm. The bit or distal end exhibits slight dulling distributed evenly along the edge perimeter. A large spall has been removed from one side of the bit which appears to have been a result of use. The edge in this area is sharp suggesting that the area of the spall was not used in further activities. The edge angle of the bit approximates 90° with undercutting step attrition. The bits have snapped off specimens 12·7·31·1 and 2·5·33·1 precluding a discussion of their morphology. The lateral margins of 12·7·31·1 do not exhibit grinding or macroscopic evidence of edge dulling. On the other hand, 2·5·33·1, like 13·2·32·1, contains one bifacially retouched marginal edge which shows evidence of edge dulling and smoothing along the perimeter.

Specimen 13·1·31·32·2 was produced from a thick, prismatic blade struck from a yellowish brown chalcedony core. The proximal end of the lateral margins contain large, possibly hafting, notches (about 20mm in width) exhibiting highly stepped, edge blunting or backing within their perimeters. Specimen 14·2·32·2 was manufactured on a thick, rectangular tertiary flake of a purplish, flow-banded latite felsite. The lateral and distal edges are well shaped by retouch. The proximal end was unaltered and the original platform of the flake is still visible. Specimen 2·7·31·1 was manufactured from a primary decortication flake of purplish, flow-banded, latite felsite. There is very little retouch modification along the lateral margins and the proximal end is unmodified cortex.

Specimen 4·5·35·3 was manufactured from a large rectangular quartz flake. Retouch is confined to the distal working edge of the tool. A large spall was removed from the area of intersection between the distal and one lateral edge creating a graver point and perhaps a hafting notch. If it were not for the steep retouch applied to the distal edge, it would be tempting to reclassify this specimen because of its unusually large dimensions. The axial length is 86mm, the maximum width is 73mm, its maximum thickness is 26mm and the transverse or distal working edge is 62mm in width.

Besides the edge dulling observed on specimen 13·2·32·1, the other possible wear attribute observable macroscopically on the four extant bits is step fracturing on the dorsal faces. The edges of these remaining specimens are still quite sharp. Semenov (1964:87) argues that endscrapers were used for "treating skin, for scraping and softening skins after they had been taken off the animal." He adds further that the bit must be moderately sharp to perform this currying activity, but not sharp enough to cut the pelt being processed. Semenov (1964:88) describes typical wear on endscrapers as an even edge blunting in combination with striations intersecting the bit edge transversely. Based on variability in the distribution of wear on the bit edges Semenov also suggests that endscrapers could be either hafted or hand held during use. It has also been suggested (Wilmsen 1970:73, Goodyear 1974:44-45) that especially steep-angled endscrapers may have been used to scrape or shred wood and/or bone.

Flake Blanks: The term flake blank refers to a relatively large flake intended to serve as a blank in the manufacture of a tool.

Two large quartz flakes (see Plate 2) were recovered from Excavation Unit 4 in association with the massive quartz endscraper (4·5·35·3) described above. These materials were found generally parallel to the T_1 terrace in a disturbed area of irregular shape. The area was filled with a mixture of tan alluvial sand and red clay. The irregular outline of the depression would suggest that it was formed by some natural means such as tree root disturbance.

The proximity of these items suggests that they were left on the site upon abandonment as a cache of raw material. The generally early to middle life-history stage of most of the personal gear (especially the unifacial adz and Hardaway-Dalton points) suggests that it may have been left at the site as a gear cache. In an area of high raw material availability, such as the environs of 31Ch29, this may be a characteristic disposal pattern. Thus, much of what has been described above as personal gear may also function as site furniture in the Hardaway-Dalton floor.

The general metric dimensions of the flake blanks are listed below:

Artifact Number	Maximum Width (mm)	Maximum Length (mm)	Maximum Thickness (mm)	Weight (Grams)
4·4·35·4	76	83	26	162
4·5·35·2	60	97	30	165

II. Situational Gear consists of three major classes of artifacts 1) thick unifaces and/or edge damaged flakes; 2) thin unifaces and/or edge-damaged flakes and 3) chisels.

Thick Unifaces/Edge-Damaged Flakes: This class is composed of two specimens, 3·1·32·2 and 10·4·31·1. The former is fashioned from a broken quartz flake. Minimal retouch has been applied to approximately half of the convex edge. The only traces of wear are step fractures occurring along the dorsal perimeter of the retouched edge. All wear appears to be unifacial. Specimen 10·4·31·1 has the characteristics of a side scraper with a straight lateral edge. No retouch has been applied, however. The tool edge was formed fortuitously from an approximate 90° lateral break in the flake. The dorsal face exhibits numerous large step fractures presumably resulting from use. The used edge exhibits slight blunting. Again use wear appears to be strictly unifacial. The tool was made of a purplish gray latite.

Thin Unifaces or Edge-Damaged Flakes: As a class these five items have four things in common: 1) relatively acute working edges; 2) they are made on thin flakes; 3) convex working edge and 4) unifacial wear. Specimens 6·2·30·1, 10·6·30·2, and 13·2·33·1 exhibit unifacial retouch along the margins, while 14·2·33·1 and 14·2·32·1 are unmodified by retouch. Macroscopic wear consists of unifacial nibbling scars, edge collapsing, and slight to negligible edge dulling. This would suggest a scraping function as opposed to cutting.

ARTIFACT PROVENIENCES – PLATE 1

HARDAWAY-DALTON ENDSCRAPERS (LAMELLA 16)

1. 14.2.32.2
2. 12.7.31.1
3. 13.2.32.1
4. 13.1.32.2
5. 2.5.33.1
6. 2.7.31.1
7. 4.5.35.3

DATA RECOVERY AT SITES 31CH29 & 31CH8
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PLATE 1
HARDAWAY-DALTON
END SCRAPERS
31CH29-BLOCK A

ARTIFACT PROVENIENCES — PLATE 2

HARDAWAY-DALTON & PALMER FLAKE TOOLS

1. 10.6.30.2
2. 16.3.30.1
3. 14.6.30.3
4. 12.6.30.1
5. 8.2.24.1
6. 10.4.31.1
7. 13.2.33.1
8. 1.7.28.2
9. 14.8.29.6
10. 8.2.25.3
11. 4.2.23.1
12. 3.2.24.8
13. 16.2.27.2
14. 15.4.28.1
15. 1.1.26.2
16. 10.7.28.8
17. 14.5.27.2
18. 2.1.23.1

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PLATE 2
HARDAWAY-DALTON &
PALMER FLAKE TOOLS
31CH29-BLOCK A

ARTIFACT PROVENIENCES – PLATE 3

HARDAWAY-DALTON PROJECTILE POINTS (STRATUM 16)

1. 16.1.32.1
2. 3.8.30.1

PALMER I – PROJECTILE POINTS (STRATUM 15)

3. 14.4.30.1
4. 12.5.26.1
5. 16.7.28.2
6. 16.4.29.1
7. 12.4.28.1
8. 16.4.27.7
9. 2.5.30.5

PALMER II – PROJECTILE POINTS (STRATUM 14/13)

10. 8.5.25.2
11. 8.5.26.1
12. 5.5.27.4
13. 1. .26.1
14. 5.3.27.2
15. 15. .27.1
16. 16. .26.1

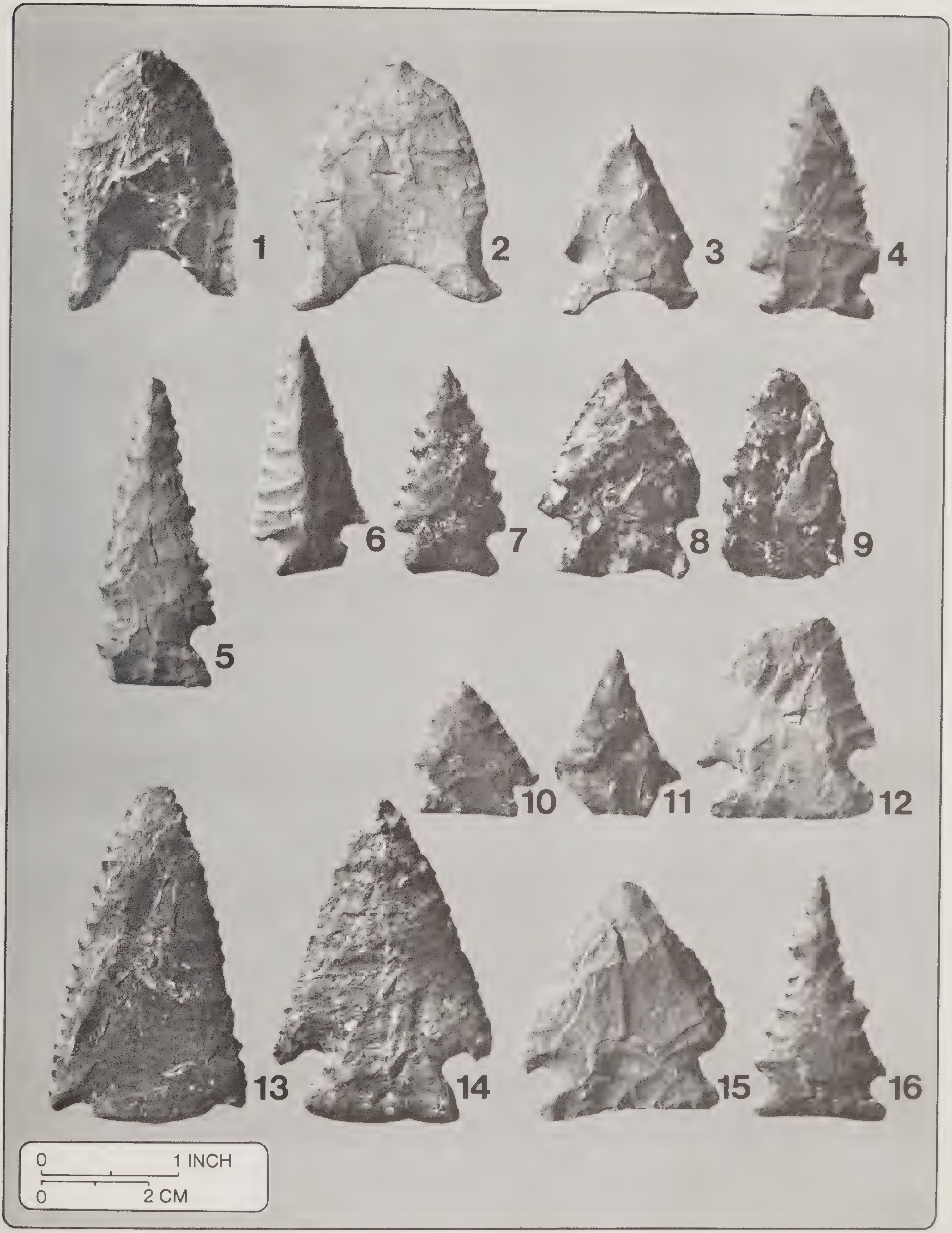

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PLATE 3
HARDAWAY-DALTON &
PALMER PROJECTILE POINTS
31CH29-BLOCK A

Chisel: Specimen 12·6·30·1 (see Plate 2) represents a chisel expediently fashioned from flow-banded latite felsite. The bit is bifacially retouched and the edge has assumed a typical cup-shaped or gouge-like outline. The edge exhibits a good deal of step fracture breakage from use. Edge dulling is not macroscopically observable. One of the lateral margins exhibits conchoidal retouch perhaps to aid in hafting the tool. The tool measures 36mm wide x 60mm long x 13mm thick and weighs 36 grams. The three edge angles of the bit are: R1/4 = 66°; Center = 45°; L1/4 = 49°.

Palmer Occupation Floors

Three distinct Palmer occupations were distinguished from Block A excavations. Stratigraphically these occupation floors are associated with lamella 15 (Occupation I), lamellae 14/13 (Occupation II) and lamellae 12/11 (Occupation III). Occupation III could also be identified as Kirk Corner-notched since the projectile points exhibit many of the characteristics of this point style as described by Coe (1964:69-70) and Chapman (1975 and 1977), especially their large size. However, these points also retain a high incidence of basal grinding. Other aspects of the assemblage, most notably the presence of Type I endscrapers, indicate continuities with the earlier Palmer occupations. The stratigraphic position of Occupation III nevertheless indicates a transitional step between Palmer and Kirk and could be assigned to either a Palmer or Kirk Corner-Notched cultural affiliation.

Lamella 15 — Palmer Occupation I

I. *Personal Gear* associated with this floor consists of 1) Projectile Points; 2) Type I Endscrapers; 3) Bifaces; and 4) Flake Blanks.

Projectile Points: Seven complete or nearly complete points and one projectile point tip (see Plate 3) were recovered from the Palmer I occupation. These points are consistent with Coe's (1964:67) Palmer Corner-notched type: "A small corner-notched blade with a straight, ground base and pronounced serrations." Of the six observable bases all but one, specimen 16·7·28·2, exhibited heavy grinding or smoothing along their edges. The central basal portion of specimen 14·4·30·1 has collapsed leaving an arc-shaped concavity. However, both remaining ends of the base exhibit heavy grinding. Specimen 16·4·27·7 has been rechipped along the center of the basal edge, but also exhibits heavy grinding in areas where the older basal edge remains. Specimen 16·7·28·2 is the only example of slight basal grinding.

Basal concavities may relate to the need to thin the haft element for re-hafting. This can be demonstrated by examining three examples. As was discussed above, the base of 16·4·27·7 had been rechipped along the center of the edge, consequently removing some of the original, highly ground edge. Two other specimens, 12·5·26·1 and 12·4·28·1, with

slightly concave bases exhibit heavy grinding across the entire length of the edge, but the grinding is less developed in the center. It is confined primarily to the edge, but is more extensive at the ends extending onto the face of the haft.

Pronounced serration of the blade occurs on four of the seven whole or nearly whole specimens. Opposite edge bevelling occurs as the resharpening strategy on all but one example, 2·5·30·5, which is plano-convex in section and represents an early stage discard.

Table 9.1
Metric dimensions and edge angle data for
Palmer I projectile points

Dimensions	n	$\overline{x}$	Range
Maximum Thickness	7	6.14	5-7mm
Maximum Thickness (2)	7	5.71	5-7mm
Base Width	6	21.17	14-25mm
Tang Width	6	16.17	12-20mm
Shoulder Width	7	23.43	20-30mm
Blade Width 1/2 Up The Blade	7	16.14	13-22mm
Axial Length	6	42.50	35-56mm
Tang Length	6	9.83	8-11mm
Blade Length	7	33.14	24-45mm
Notch Length	6	8.17	4-12mm
Angle 11/Angle 21	14	47.50°	27°-70°
Angle 12/Angle 22	14	52.57°	32°-62°
Angle 13/Angle 23	14	51.64°	38°-65°
Tip Angle	7	50.14°	29°-70°

Endscrapers: A total of 14 endscrapers were recovered from this occupation floor. All but one of these, specimen 15·9·29·3, correspond to Coe's (1964:73-76) Type I endscrapers (see Plate 4). The remaining specimen approximates Coe's (1964:76) Type III endscraper category. Four of the Type I endscrapers (8·4·28·2, 4·9·29·1, 8·8·29·2, 15·5· 29·2) contain graver spurs at the juncture of the transverse edge and one lateral margin. One specimen (13·5·29·3) exhibits a "hafting notch" (see Coe 1964:75) on either lateral margin.

All observable bits (n = 13) showed evidence of three major kinds of wear. First, large step fractures are prevalent on the dorsal face of the bit originating from the working edge. Often these step fractures undercut the face of bit (e.g., 8·3·29·1). The second kind is manifested as fine nibble scarring running along the bit edge. A final kind of use-wear was edge polishing. This occurred prominently on only one specimen, 12·2·27·2. Polish

was distributed regularly across the bit edge and extended less than 1mm up the face on the right side of the bit. Many of the other specimens exhibited possible slight polish or dulling along the edge, as gauged by running the thumb across the surface of the edge, but this could not be observed macroscopically.

Hayden (1979c) indicates that all of these wear characteristics are consistent with those observed on Alaskan Eskimo and Arapaho endscrapers known to have been used for scraping skins. The average edge angle of the bits from his collection was 76.4° (Hayden 1979c:211). This is remarkably similar to the mean of 74.23° obtained for the center angle of the Palmer I population. Similar ranges were also noted: 55°-100° for Hayden's collection and 63°-96° for the Palmer I set.

Table 9.2
Summary statistics for Palmer I endscrapers

	n	$\overline{x}$	Range
Maximum Width (mm)	14	28.86	23-35
Maximum Length (mm)	11	29.67	24-45
Maximum Thickness (mm)	14	8.79	5-14
Weight (Grams)	11	9.64	5-17
Angle 1 (Transverse Edge)	13	76.07°	50°-83°
Angle 2 (Transverse Edge)	13	74.23°	63°-96°
Angle 3 (Transverse Edge)	13	66.92°	59°-88°

Bifaces: Bifaces other than projectile points are first present in the Palmer I occupation at 31Ch29. The bifaces can be broken down into two sub-classes: 1) manufacturing discards and debris and 2) thin, utilized bifaces.

The first sub-class consists of two artifacts. Specimen 10·1·29·1 is a small, thick, whole biface that appears to have been rejected as a consequence of unsuccessful thinning at one end. No evidence of wear was observed along its edges. The other specimen, 13·8·28·3, is an edge fragment of a thick biface. Again no evidence of wear could be found.

The second subclass consists of four biface fragments. Specimen 16·6·28·4 represents a convex end fragment of a thin biface manufactured from a pale green meta-siltstone. Extreme smoothing occurs along the entire remaining edge and extends onto both faces. Edge smoothing is greater along the convex end than the sides. The character of the polish along the sides does not differ from that observed on the ends, however, suggesting that it is caused by use of the implement rather than by edge grinding. Facial wear extends evenly over about the first 10mm of each face and over all of the flake scar ridges. A series of stepped flake scars emanate from the edge of the biface end, extending across one face

for about 10mm. Some characteristics of this wear pattern parallel those described for the Dalton Adz (Morse and Goodyear 1973; Goodyear 1974) suggesting some kind of woodworking activity. However, traces of smoothing on both sides of the biface would indicate a use more like that of an ax (Semenov 1964:126).

A similar wear pattern is evident on specimen 5·7·29·2 which represents another thin biface end with a subrectangular edge outline. This fragment also is manufactured from a pale green meta-siltstone. It will be recalled from the discussion of variability in the rate of wear accumulation on stone tools that raw materials with weaker silica bonds, such as chert or meta-siltstone, might show the results of wear attrition more readily than harder rocks, such as meta-volcanics (see Kamminga 1979). This may also effect qualitative differences in wear patterns such as the difference between smoothing and polishing. Thus, much of our evidence concerning the uses of the various classes of tools may come from stone of primary sedimentary origin.

Specimen 5·7·29·2 differs from the previous specimen in that it appears to have undergone a resharpening episode just prior to its final discard. Smoothing is principally confined to the edge and the ridge scars of both faces, extending onto one face in several places, but not nearly as extensively as in specimen 16·6·28·4. Specimen 16·6·28·4 is characterized by an erratic transverse break resulting in large hinge fractures on both sides of the break. Specimen 5·7·29·2 exhibits a single step transverse break running along the projected center of the original biface. It is possible that both ends of the bifaces were used for axing. If this were the case, these fragments may represent a portion of tools left in the haft after breakage. However, they also may represent primary discard modes if they are tool fragments not confined to the haft.

A biface made of a similar meta-siltstone was found in a cache of items (Feature 52) associated with the Palmer I occupation and is useful in understanding the hypothesized discard modes. Specimen 2·8·29·4 (see Plate 5) is a thin biface like the specimens previously discussed. It has a typical ax-like outline, exhibiting wear patterns identical to the other two. Smoothing is along the edge, but is most pronounced and extensive on the faces of the biface at the ends. The large convex end shows evidence of at least one resharpening, creating both slightly worn spots along the edge and face and extremely worn spots which were produced by usage prior to that resharpening. The opposite end is convex, but much more acute. Since smoothing also is extensive along this edge, both ends of the tool were used and may represent aspects of the same activity. Thus, it is possible that the tool fragments discussed above were the portions of axes left in the haft at the end of activity. Since their sizes and shapes are different, no strict design constraints seem to have been placed on their initial edge morphologies.

The remaining two bifaces may represent projectile point fragments. Specimen 11·8·28·1 is a tip or basal fragment of a thin biface. Traces of wear were not directly observable. Specimen 13·1·30·2 is made of an unusual prophyritic raw material that was also

used to produce one of the projectile points, 2·5·30·2. The lateral edges are sharp indicating a resharpening episode close to the time of its final discard. The tip, by contrast, exhibits heavy polishing extending onto both faces along flake scar ridges. One side of the tip has been removed leaving a wide step fracture. The surface of this fracture exhibits heavy polishing as well, especially along its ridges which connect to each face of the biface respectively. The acute convergence of the lateral edges in a tip, and size indicate that this biface served a function similar to a projectile point, if it does not actually represent a projectile point. The extreme polishing suggests cutting on a soft material such as meat.

Flake Blanks: Besides the cache (Feature 52) to be discussed later, only one flake blank was recovered from the Palmer I floor. Specimen 12·2·27·3 (see Plate 5) is 79mm long, 60mm wide and 15mm thick. These dimensions are consistent with the size parameters of the blanks and bifaces from the cache. The flake was removed from a large bifacial core as evinced by one lateral edge that retains the original sinuous outline indicative of bifacial reduction. This might otherwise have been interpreted as intentional bifacial retouch applied to one edge of the flake had we not been able to view the contents of another cache, Feature 22. Feature 22 contained 151 flake blanks and a large bifacial core of the same material (see Plate 18). All of these flakes exhibited sinuous edges on one side, generally emanating from their striking platforms, but only very few of the flakes could be considered bifaces. Flake removals from bifacial cores could have produced this pattern. Flakes could take on the appearance of incomplete bifaces without ever having been retouched. Instant bifacial tools could be produced as a consequence of the special core preparation techniques involved in reducing bifacial cores.

II. Situational Gear: Deriving meaningful classifications for the array of retouched and unretouched flake tools that comprise the situational gear of an assemblage is a difficult task. Hayden's (1979a) ethnographic observations of Western Desert Aboriginal technology are perhaps instructive in this regard since the aboriginal chipped stone tool assemblage is comprised entirely of what Binford (1977 and n.d.) has called situational gear.

The situational gear from the Palmer I floor has been divided into four classes: 1) thick-edged side-scrapers; 2) thin-edged side-scrapers; 3) chopping implements and 4) core fragments. Since the tools in Classes 1 and 2 typically exhibit unifacial wear or retouch along their lateral edges, the only criterion considered of possible importance was the thickness of the working edge.

Thick-edged Unifaces: The 12 tools in this class (see Plate 6) equate with Coe's (1964:77-78) side scraper I or II types:

> All specimens of this type were made from large, wedge-shaped flakes that were struck from a flat or prepared striking platform. Most of these specimens retained a considerable portion of this platform, as well as the bulb of percussion, in their finished form. The working edge of this type was rounded or crescent shaped and either one or both ends were rounded and curved back. The working edge remained sharp and irregular.

ARTIFACT PROVENIENCES – PLATE 4

PALMER I – ENDSCRAPERS (STRATUM 15)

1. 8.8.29.2
2. 4.9.29.1
3. 8.4.28.2
4. 14.4.29.2
5. 13.5.29.3
6. 12.8.27.1
7. 14.1.29.1
8. 14.2.29.3
9. 8.3.29.1
10. 16.5.28.7
11. 12.2.27.2
12. 15.5.29.2
13. 16.4.28.5
14. 15.5.29.3

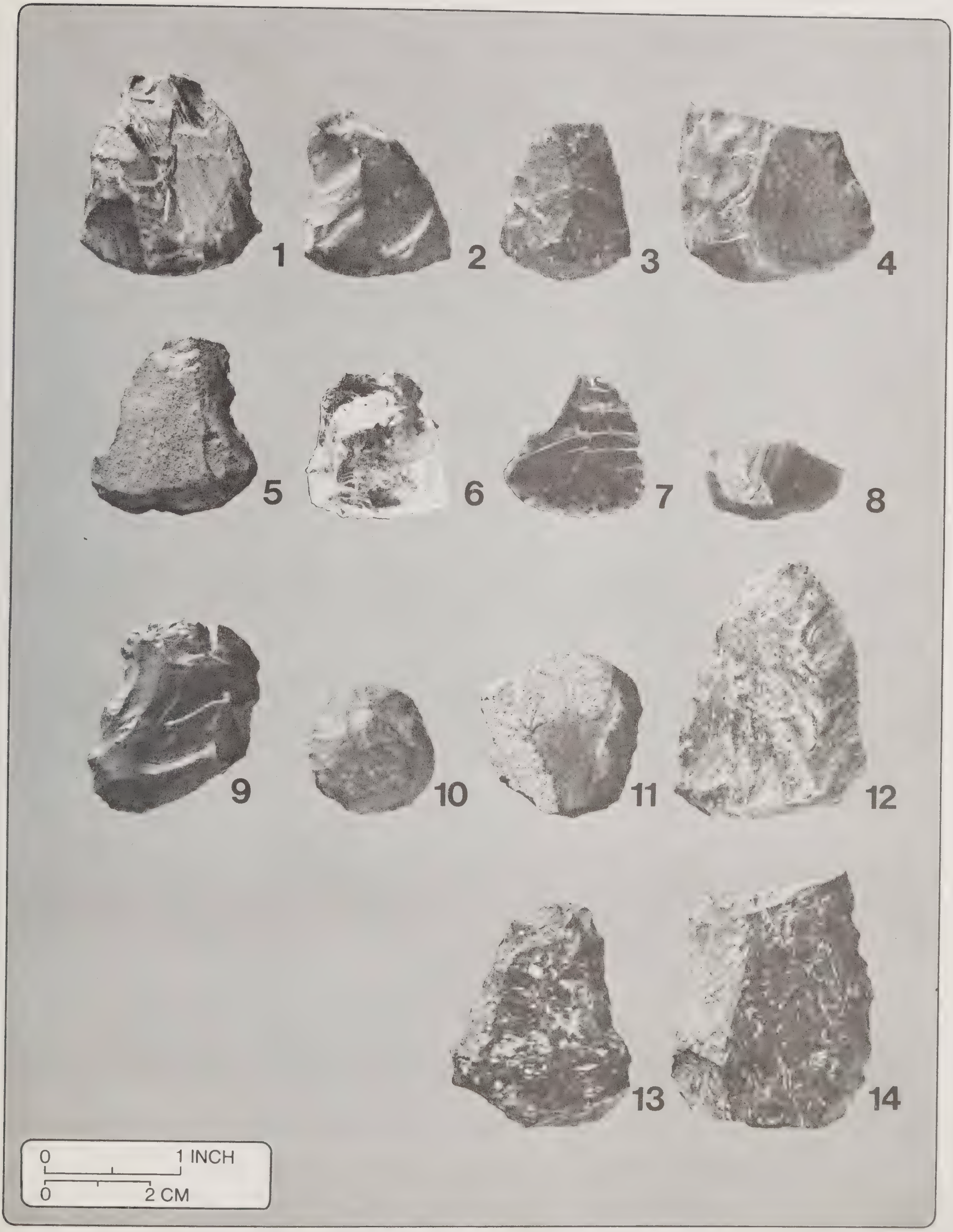

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PLATE 4
PALMER OCCUPATION I
ENDSCRAPERS
31CH29-BLOCK A

ARTIFACT PROVENIENCES – PLATE 5

1. Felsite Biface, 2.8.29.4
2. Latite Biface, 2.8.29.1
3. Latite Biface, 2.8.29.10
4. Latite Biface, 2.8.29.7
5. Latite Flake with Edge Damage, 2.8.29.12
6. Latite Biface, 2.8.29.3
7. Latite Biface, 2.8.29.2
8. Latite Flake with Polish and Edge Damage, 2.8.29.9
9. Latite Flake with Polish and Edge Damage, 2.8.29.9
10. Quartz Flake Tool, 2.8.29.6
11. Quartz Flake Tool, 2.8.29.5
12. Latite Flake with Polish and Edge Damage, 2.8.29.11

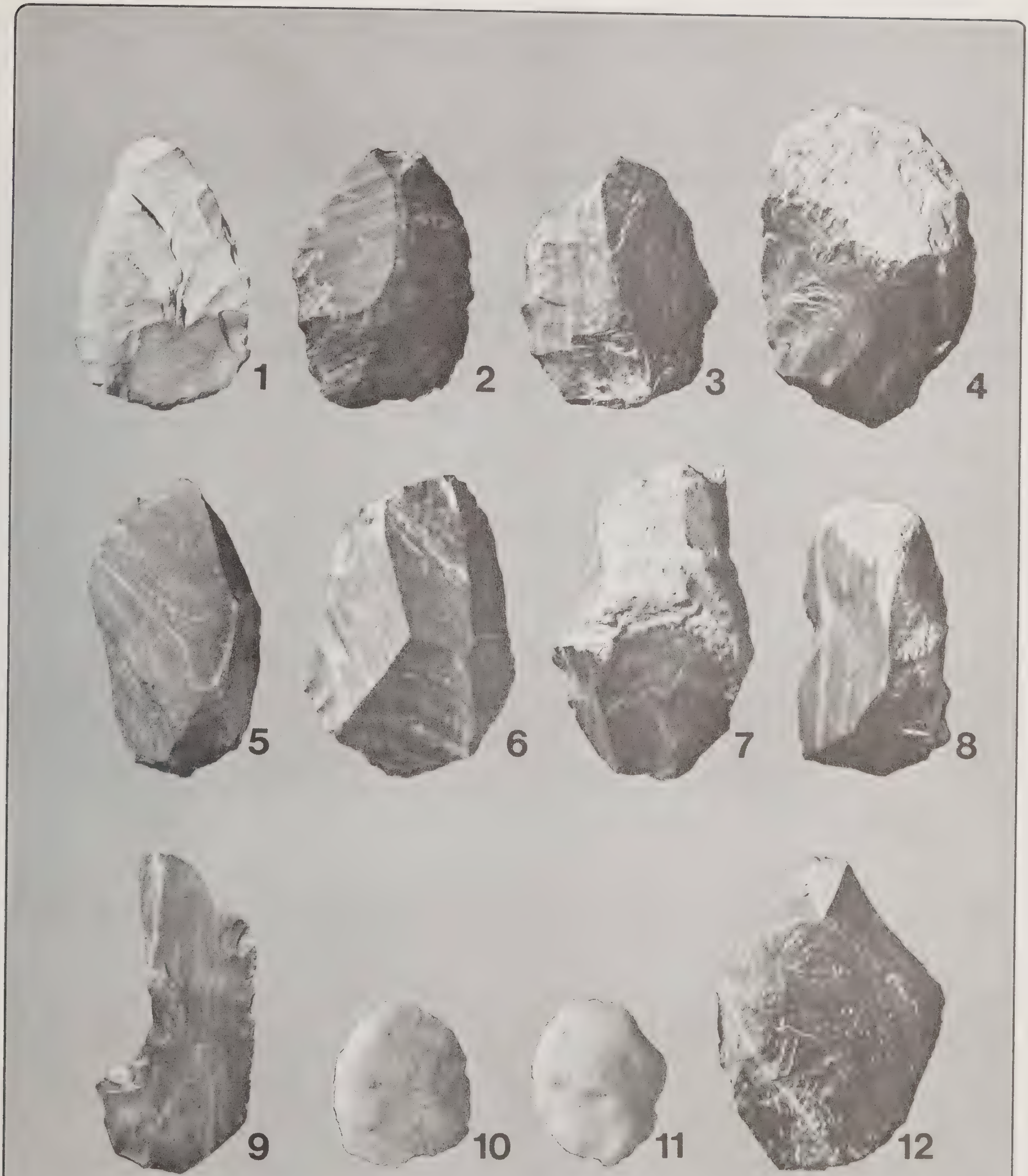

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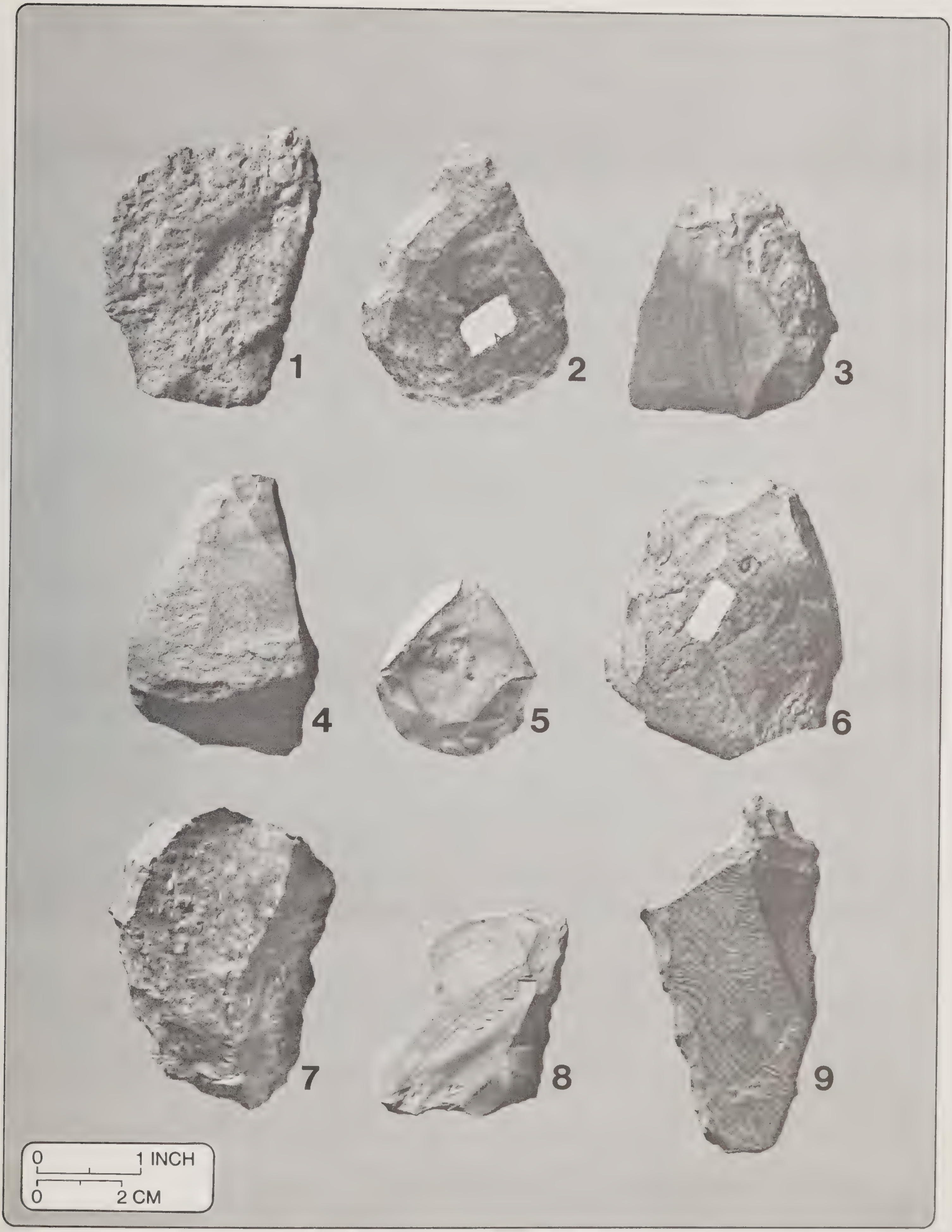
PLATE 5
CONTENTS OF TOOL CACHE
FEATURE 52
31CH29-BLOCK A

ARTIFACT PROVENIENCES – PLATE 6

1. 16.7.28.8
2. 16.1.28.1
3. 10.8.29.3
4. 7.1.29.1
5. 11.1.11.2
6. 16.4.28.6
7. 16.9.28.3
8. 16.4.27.8
9. 16.9.27.3



DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
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PLATE 6
PALMER OCCUPATION I
THICK UNIFACIAL TOOLS
31CH29-BLOCK A

This type of scraper (Type II) was made from a large irregular flake, and unlike the Type I side scraper, there was no attempt to shape the working edge into any other form than what existed. These large flakes were simply picked up, sharpened, and used. Occasionally, more than one edge on the same flake would be used.

The majority of these unifaces appear to have been removed from a prepared core of a non-bifacial type. Consistent with Coe's description, the thickest specimens exhibited relatively flat, thick platforms oriented obliquely or parallel to the long axis of the flake. The trimmer specimens by contrast, exhibited evidence of having been derived from bifacial cores. One specimen, 14·6·31·1, was made of quartz crystal and the crushing and gouge-like appearance of the platform (McPherron 1967) indicates that it was derived from a bipolar core. Worked edges of specimens 10·8·29·3, 5·9·29·1 and 14·6·31·1 lacked retouch. Edge morphology ranged from convex to straight. Specimens 16·9·28·3, 16·1·28·1 and 16·7·28·8 contain two retouched lateral edges. Specimen 14·6·31·1 has two utilized edges, one of them presenting the only example of bifacial use-wear nibbling in the Palmer I assemblage. An edge angle of 47° would suggest a composite scraping and cutting tool.

Other than unifacial stepping and nibbling the only other wear pattern discernable was occasional edge dulling. Polishing of the edges or ridge scars was absent. A common proposed function for side scrapers is hide processing. However, their gross morphological similarity to the Australian adz should not be discounted. Goodyear (1974:50) suggests wood and bone working as possible uses for side scrapers. He states: "Edge angles were computed and found to have a mean average of 64° (Table 5), again falling near the higher angled intervals of Wilmsen (1970:71), who thinks this angle would be effective for working bone and wood and for shredding." Hayden (1979a:126) indicates that polish is not a necessary wear pattern in woodworking. The high incidence of retouch on these specimens might argue against a skin processing function. Retouch was highly correlated with hafting in the Aboriginal example discussed by Hayden (1979a:12) and it was applied in order to avoid the additional effort of hafting another flake. If side scrapers were used for hide scraping, hafting would not be necessary. This interpretation assumes the traditional view, although unestablished, that side scrapers were hand held. Just as hafted endscrapers can be used for processing animal skins, so could hafted side scrapers be used for this purpose.

Summary statistics for metric and edge angle data for the thick-edge side scraper class are presented below in Table 9.3. Specimens 14·6·31·1, 7·1·29·1 and 14·9·30·2 are broken and were excluded from weight and length calculations. Variation in edge angles is seen to be a function of retouch frequency rather than use.

Table 9.3
Summary statistics for thick-edged side-scrapers, Palmer I

	n	$\bar{x}$	Range
Length (mm)	9	63.22	43-66mm
Width (mm)	12	42.25	24-64mm
Thickness (mm)	12	11.83	6-18mm
Weight (grams)	9	43.56	18-70 gm.
Center Edge Angle (Inclusive of Multiple Edges on a Single Artifact)	17	57.94°	38°-70°

Thin Edged Side Scrapers: This category consists of eight specimens which could be broadly included in Coe's (1964:77-79) Side Scraper III type: "This type is very similar to Type II and differed only in the selection of a relatively thin and narrow flake." Edge thickness (not maximum flake thickness) ranged from 2 to 5mm in this group. Treatment of the edge ranged from fine, steep pressure flaking to technologically unmodified edges with unifacial nibbling fractures. Edge angles can vary extremely as a function of retouch, but the similar unifacial wear patterns on the unmodified tools suggest that they served functions similar to the steeper edged, retouched specimens. Specimens 4·4·28·1, 13·1·30·1, 2·6·30·1, and 11·1·29·1 exhibited only unmodified edges.

Edges of these tools appear too fragile to have been used in heavy duty woodworking activities. Besides unifacial nibbling and occasional collapsing of the edge, the only other detectable wear is dulling or rounding of the immediate working edge, which was detected tactilely, but was not macroscopically identifiable. Polishing of the ridge scars or other protrusions of the faces was absent except in one case, 4·4·28·1. Here, slight polishing occurred on the ridge running down the dorsal face and the bulbar scar on the ventral face. In the other cases polishing was clearly not visible. As a group, then, a light shaving or scraping function is suggested, most likely wood shaving or light skin scraping.

Metric and edge angle summary statistics for this class are detailed below:

Table 9.4
Summary statistics for thin-edged side-scrapers Palmer I

	n	$\bar{x}$	Range
Length (mm)	7	43.43	23-68mm
Width (mm)	8	29.63	16-37mm
Thickness (mm)	8	5.63	2-12mm
Weight (grams)	8	7.30	2-22 gm.
Center Edge Angle (Including Multiple Edges)	12	55.92°	36°-75°

Chopping Implements: The only example of this tool class is Specimen 10·6·30·2. The implement is made from a large primary spall of dense meta-igneous material. Dimensions of the tool are 106 x 78 x 34mm and it weighs 404 grams. The working edge has been crudely bifacially chipped along one lateral margin. Wear along the edge consists of large bifacial step fractures, edge crushing, and dulling or rounding confined exclusively to the perimeter of the edge. This rounding is associated with a darker coloration. Slight rounding of the ridge scars on the ventral face was also observed. The edge opposite the cutting edge is naturally backed with cortex suggesting that the chopping implement was hand held and used in a manner similar to the way in which the Aborigines (Hayden 1979a) use them. The size, edge morphology and wear patterns suggest that the tool was used as a hand-held chopper for heavy duty work.

Cores: The only evidence of flake cores in the Palmer I occupation floor derives from three pieces of quartz. Two of these pieces, 2·8·30·2 and 7·1·30·1, represent amorphous, small fragments of larger quartz cores. They weigh 25 and 27 grams respectively.

The other piece (2·4·30·3) represents a larger core fragment (72 grams) exhibiting a convex platform with long, lamellar flakes originating from it and extending down the entire face of the core. These scars may represent core preparation for the removal of a flake blank. This specimen, on the other hand, could represent what Goodyear (1978) has described as thick quartz flakes which exhibit steeply retouched working edges and which may have functioned as scrapers for bone or woodworking.

III. Site Furniture consists of a cache (Feature 52) of 12 tools recovered from the Palmer I occupation floor (see Plate 5). All artifacts in the cache exhibited edge damage and rounding or polishing from utilization.

Seven bifaces were contained in the inventory, three of which (2·8·29·1, 2·8·29·4 and 2·8·29·10) were thin and finely shaped, the remaining four (2·8·29·2, 2·8·29·3, 2·8·29·7 and 2·8·29·11) being thick and only partially shaped by bifacial retouch.

The forms of specimens 2·8·29·1 and 2·8·29·10 are reminiscent of examples of Hardaway Blades illustrated by Coe (1964:65). The length and width measurements are within the large extreme of this type, but they are considerably thicker (16 and 17mm vs. a range of 5 to 12mm for the Hardaway Blade). In addition, they are clearly associated stratigraphically with the Palmer I floor.

The other five items in the cache are tools used as situational gear. Specimens 2·8·29·8, 2·8·29·9, exhibit the same patterns of wear as the bifaces. The lateral edges are cursorily chipped to create partially sinuous outlines and the projections invariably were rounded and polished. One end of the flake is composed of cortex which shows evidence of only slight rounding. The ridge scars of the dorsal face are extremely rounded and polished at this end.

Portions of the face below the ridge scars are also heavily polished and in some areas the cortex has been removed. Polishing on the ventral surface is less visible due to the paucity of ridge scars, but nevertheless occurs on the few that are present. All of this evidence would point toward including this specimen in the same use class as the bifaces.

Specimens 2·8·29·9 and 2·8·29·12 represent unaltered flakes with unifacial nibble and step fractures occurring across their lateral edges. The edge angles of the utilized edges (2·8·29·9 = 2 utilized edges, 2·8·29·12 = 1 utilized edge) are quite acute ranging from 3° to 38°. The edges are essentially straight in outline averaging about 60mm in length. Polishing and rounding occurs in isolated areas across both faces, especially on ridges. Since the use orientation on these specimens is lateral rather than transverse as in the other examples, it is suggested that they were put to different uses. The acute angles of the used edges might suggest a cutting function, but the unifacial wear is more indicative of a one-way scraping activity.

The final two artifacts, 2·8·29·5 and 2·8·29·6, are disc-shaped quartz flakes with plano-convex sections. Specimen 2·8·29·5 appears to have been derived by splitting a small, thick bifacial core in half. The platform edge still retains of good deal of the bifacial edge. The opposite edge shows evidence of unifacial nibbling and step factures indicative of a scraping motion. This edge is convex and fortuitously denticulated with an edge angle of approximately 70°. No retouch could be observed. Polish was not apparent macroscopically. Specimen 2·8·29·6 also contains a convex edge with similar wear indications. This edge is much thinner than the previous specimen, but the average edge angle is approximately 70° as well.

The respective wear patterns and implied uses of the items from this cache are highly suggestive of heavy butchering and skin or hide processing. In addition, the presence of two broken bifacial "ax bits", specimens 5·7·29·2 and 16·6·28·4, at dispersed locations on the floor suggests that heavy butchering may have been going on simultaneously with hide processing and other maintenance activities. The use of axes for butchering suggests possible association of skinning racks. In the Navajo case (Binford and Bertram 1977) the use of the ax was greatly facilited by the suspension of the sheep on a rack. Although this association does not hold true in every case where chopping is incorporated into butchering techniques (i.e., The Casper site, Frison 1974: 51-56), the relationship should nevertheless be considered a strong possibility. In the case of the Casper site, the construction of racks to support 1,000 lb. bison might entail an unreasonable amount of effort. Deer, on the other hand, and smaller animals like sheep, are quite appropriate for rack butchering.

Metric and edge angle summary statistics artifacts composing the cache are presented below in Table 9.5 The "axes" category consists of specimens identified by use wear and morphology as axes in the text (Numbers 1, 2, 3, 4, 7, 8, 10, 11). The latite scrapers are specimens 9 and 12; the quartz scrapers are numbers 5 and 6. When more than one edge was used on a single artifact, edge angles were taken from all edges, thus explaining the greater number of cases than artifacts.

Table 9.5
Summary statistics for Tool Cache, Feature 52

"Axes" n = 8	n	$\overline{x}$	Range
Length (mm)	8	87.25	78-97mm
Width (mm)	8	57.25	42-66mm
Thickness (mm)	8	19.75	12-26mm
Center Transverse Edge Angle	9	50.33°	40°-58°
Latite "Scrapers"			
Length (mm)	2	95.0	90-100mm
Width (mm)	2	47.0	–
Thickness (mm)	2	13.0	11-15mm
Center Lateral Edge Angle	3	36.33°	35°-38°
Quartz "Scrapers"			
Length	2	50.5	49-52mm
Width	2	42.5	42-43mm
Thickness	2	16.5	14-19mm
Center Edge Angle	2	66.5°	63°-70°

Lamellae 13/14 – Palmer II Occupation

The second Palmer occupation floor is associated with lamellae 13/14. These lamellae exhibit a good deal of bifurcation and blending and exist as a single lamella across most of the block. In areas of bifurcation artifacts are strongly concentrated on a single lamella indicating that the Palmer II floor has retained much of its integrity despite lamellar structure irregularities. The stylistic distinctiveness of Palmer projectile points also supports this contention. The Palmer I and II points share heavy basal grinding, but the Palmer II points are characteristically wider.

A number of later projectile points (see Plate 3) were recovered from Excavation Units 1 and 2, suggesting a localized disturbance in this floor. Artifacts from the disturbed area (squares f, h and i of Excavation Unit 1 and squares a, b, c, d, e, and f of Excavation Unit 2 to a depth of arbitrary Level 25) were eliminated from the analysis.

I. Personal Gear from the Palmer II occupation can be divided into three classes: 1) Projectile points; 2) Endscrapers, and 3) Bifaces.

Projectile Points: a total of seven whole or nearly whole projectile points are associated with this floor (see Plate 3). The typological designation *Palmer Corner-notched* is preferred to *Kirk Corner-notched* because of the presence of heavy grinding or polishing on all of the observable bases (n = 6). However, there are sufficient differences in the width dimensions of Palmer I and Palmer II points to suggest that these occupations were separated by adequate time to allow for systemic design changes. Clearly these points exhibit attributes of both Palmer and Kirk Corner-notched types, an expected characteristic of an evolving technological system. Point types are generally defined on the basis of one well-stratified site and all subsequent research is constrained by these derived types. However, occupations from other sites may represent slightly different stages of a continuous developmental scheme. However, grouping the Palmer II points into a new distinctive type would only cloud or complicate the general developmental picture which we wish to explain. Instead, the distinguishing aspects of this point cluster will be an indicator of directional change within a general corner-notched point tradition. The points from the Palmer I and Palmer II floors can be included on a time ordered continuum of directional change in an adaptive system, thus avoiding needless proliferation of types.

Coe (1964:70) describes the general direction of design change in corner-notched points in the following manner:

> This type [Kirk Corner-notched] appears to have evolved from the earlier Palmer type. The overall size about doubled, and the bases ceased to be ground. Percussion techniques appeared to have been used more extensively with only the final shaping of the edges, notches and serrations being done by pressure flaking.

The Palmer II points show a definite size increase over the Palmer I set, but still retain heavy basal grinding. However, size changes appear to be reflected differentially in the various point elements. Table 9.6 below presents a comparison of mean size dimensions of Palmer I and II points and demonstrates the direction of these changes:

Table 9.6
Mean dimensions of Palmer I and II points

Dimensions (mm)	n	Palmer I:$\bar{x}$1	n	Palmer II:$\bar{x}$2
Maximum Thickness	7	6.14	7	6.29
Base Width	6	21.17	5	25.20
Tang Width	6	16.17	6	19.67
Shoulder Width	7	23.43	7	29.71
Tang Length	6	9.83	6	10.17
Blade Length	7	33.14	6	34.83

There is a general size increase from Palmer I to Palmer II but some dimensions increase at a greater rate than others. Thickness and length show very little change, while width of the shoulder, tang and base show more extreme increases. To understand the relative significance of the various changes a two sample difference of means test, the t-distribution (see Blalock 1972:220-228), was applied to each of these dimensions. It should be noted that the data were not derived from random sampling and the number of cases is very low. Thus, the derived values cannot be considered accurate population parameter estimates in a strict statistical sense. However, it is felt that these statistical tests can be used to compare the relative magnitude of change in these elements. This position is considered valid because the design consistency of projectile points exhibit makes them accurate reflections of wide-spread systemic technological change.

The results of the t-tests are displayed below:

1. **Thickness:** **Palmer I** **Palmer II**

	Palmer I	Palmer II
	n1 = 7	n2 = 7
	s1 = 0.64	st = 0.88

$t\bar{x}_1 - \bar{x}_2 = 0.34$, $p > .10$ with 12 degrees of freedom for a one-tailed test, $\sigma_1 = \sigma_2$

2. **Blade Length:**

	Palmer I	Palmer II
	$n_1 = 7$	$n_2 = 6$
	$s_1 = 6.13$	$s_2 = 12.98$

$t\,\bar{x}_1 - \bar{x}_2 = 0.27$, $p > .10$ with 11 degrees of freedom for a one-tailed test, $\sigma_1 \neq \sigma_2$

3. **Tang Length:**

	Palmer I	Palmer II
	$n_1 = 6$	$n_2 = 6$
	$s_1 = 1.21$	$s_2 = 2.34$

$t\,\bar{x}_1 - \bar{x}_2 = 0.29$, $p > .10$ with 11 degrees of freedom for a one-tailed test, $\sigma_1 \neq \sigma_2$

4. **Base Width:**

	Palmer I	Palmer II
	$n_1 = 6$	$n_2 = 5$
	$s_1 = 4.06$	$s_2 = 3.76$

$t\,\bar{x}_1 - \bar{x}_2 = 1.53$, 10 F $p > .05$ with 9 degrees of freedom for a one-tailed test, $\sigma_1 = \sigma_2$

5. **Tang Width:** **Palmer I** **Palmer II**

	Palmer I	Palmer II
	$n_2 = 6$	$n_2 = 6$
	$s_1 = 2.73$	$s_2 = 2.47$

$t\,\bar{x}_1 - \bar{x}_2 = 2.13$, $p = .025$ with 10 degrees of freedom for a one-tailed test, $\sigma_1 = \sigma_2$

6. **Shoulder Width:** **Palmer I** **Palmer II**

	Palmer I	Palmer II
	$n_1 = 7$	$n_2 = 7$
	$s_1 = 3.02$	$s_2 = 6.09$

$t\,\bar{x}_1 - \bar{x}_2 = 5.11$, $p < .0005$ with 12 degrees of freedom for a one-tailed test, $\sigma_1 \neq \sigma_2$

The t-statistics for thickness, tang length and blade length indicate no difference between the two samples. That is, the data could easily have been drawn from the same population. The slightly larger means for the Palmer II sample may reflect size adjustments to compensate for larger width dimensions. One possible exception to this interpretation is blade length. The variance (s^2) of the Palmer II cluster (168.48) is more than four times as large as that of the Palmer I cluster (37.58) indicating more size variation in the former sample. Scanning the Palmer II sample indicates that this high variance is brought about by two unusually small points (8·5·25·2 and 8·5·26·1). If these two points are eliminated from the analysis, and the four remaining points of this cluster are compared to the four longest points of the Palmer I cluster, the following central tendency statistics for blade length are derived:

Palmer I	Palmer II
$\bar{x}_1 = 35.75$	$\bar{x}_2 = 41.75$
$s_1 = 5.63$	$s_2 = 10.28$
$s_1^2 = 31.70$	$s_2^2 = 105.69$

The means diverge more than previously. Variance in the Palmer II sample is greater since blade lengths are still much more variable in that group. But a t-value of 1.02 for a difference of means test (Model 2: $\sigma_1 \neq \sigma_2$) between these samples indicates that blade length differences between the two samples cannot be considered significant, even under these adjusted conditions.

Shoulder width appears to have undergone the most extreme change in the sample, followed by tang width, and then base width. But the increase in base width is inconclusive since the results from the two samples could have occurred 5 to 10 times out of 100 if the samples were drawn from the same population.

Other attributes of the Palmer II cluster represent continuances of the Palmer I cluster. Opposite bevelling continues as the blade resharpening strategy. Heavy serration occurs on two of the specimens; light serration on worn edges occurs on two other cases. Wear is principally confined to the edges of the blade, consisting of edge dulling or rounding with occasional polish. Three projectile point fragments, two tips and one serrated lateral section fragment were also found on this floor.

Endscrapers: A total of 10 endscrapers and endscraper fragments were recovered from the Palmer II floor (see Plate 7). Unlike the highly stylized endscraper assemblage of the Palmer I occupation, endscrapers from the Palmer II assemblage exhibit far less consistency in design. Coe (1964:73-77) described this variability in morphology in terms of types. The Type I endscraper is the most highly stylized form and "appeared to have a primary association with the Palmer period, although some may have been made along with the earlier Hardaway points, and may have continued to be used through the Kirk occupation (Coe 1964:73-76).

The Type II and III endscrapers exhibited less consistency in design. Type II endscrapers were manufactured on "flakes of random shapes and sizes" (Coe 1964:76). These were grouped into two varieties. One variety consisted of large, thick, irregularly shaped flakes which were expediently retouched at one end to produce a working edge. According to Coe (1964) the irregular and sharp working edge of this variety suggests use on wood or bone. The other variety Coe distinguished is composed of relatively thin, narrow flakes, retouched along the narrow end opposite the striking platform. The Type II endscrapers generally were found in Level II at the Hardaway site which is associated with Kirk Serrated and Kirk Corner-notched projectile points.

Coe's Type III endscraper was represented by only six excavated specimens, evenly distributed between Levels II, III, and IV (Kirk, Palmer and Hardaway). Coe (1964:76) indicates that this form may have an even wider cultural-historical distribution since "they constituted the majority scraper type in the Stanly and Morrow Mountain levels at the Doerschuk Site." This type was characterized as "large and rough duplications of the more finely-made Type I variety" (Coe 1964:76). Their approximate mean dimensions were 70mm x 45mm x 15mm. These specimens were marginally retouched to produce an oval outline; the working edges were sharp and irregular, unlike the smooth bit of the Type I endscraper.

Coe's artifacts manifest a loosening of design constraints on endscrapers as technologies decrease in age. The selection criteria for particular kinds of flakes for endscraper manu-

facture broaden to encompass a wide range of sizes, shapes and thicknesses. The relatively small, thick, prismatic flakes on which Type I endscrapers were manufactured were replaced by a wide array of flakes of varying sizes and shapes. In addition, the effort expended in shaping the edges decreased as working edges became less regular in shape and the lateral edges began to exhibit less shaping. Functional differences (ie. wood or bone working) could also play a role in these changes suggesting that functional differences occurred diachronically and must be considered within the context of a developmental scheme.

Examination of the Palmer II endscraper assemblage (see Plate 7) indicates that these specimens can be assigned primarily to Coe's Type I, although the oval outlines of specimens 11·5·28·2 and 13·3·28·2 suggest similarities with Type III endscrapers. There is less concern with lateral edge shaping compared to the Palmer I assemblage. Of the observable specimens the average number of retouched edges per scraper for the Palmer I assemblage is 1.71 edges (n = 28) compared to 1.20 (n = 18) edges for the Palmer II assemblage.

Variation in flake size selection appears to be roughly equal in the two samples, but the dimensions evidence changing relationships. Although the variances between samples are approximately equal, the central tendencies of individual dimensions are different. This is demonstrated in a comparison of summary statistics from the two samples:

	Palmer I				Palmer II			
	n_1	$\bar{x}_1$	s_1	s_1^2	n_2	x_2	s_2	s_2^2
Length (mm)	11	32.45	6.47	41.88	6	37.00	5.23	27.36
Width (mm)	14	28.78	4.21	17.72	8	32.50	4.40	19.39
Thickness (mm)	14	10.82	1.92	3.69	10	8.60	2.16	4.67
Weight (gms)	11	9.64	4.33	18.78	8	11.63	3.74	13.96

As can be seen length, width and weight increase from Palmer I to Palmer II. Thickness, however, decreased sharply in the Palmer II sample. Two sample difference of means tests using the t-distribution (Blalock 1972:220-228) were to run to determine the magnitude of these divergences. Results of these tests are presented below:

Dimensions	df	$x_1 - x_2$	t	Significance	Assumption
Length (mm)	15	3.48	1.57	.10	$\sigma_1 = \sigma_2$
Width (mm)	19	2.08	2.23	.025	$\sigma_1 = \sigma_2$
Thickness (mm)	21	0.63	2.87	.005	$\sigma_1 = \sigma_2$
Weight (gm)	16	1.04	2.82	.01	$\sigma_1 = \sigma_2$

If we can accept these results as a rough reflection of population parameters, then it is apparent that the most significant shifts are seen in increased width and weight and decreased thickness from Palmer I to Palmer II. The increase in length is less pronounced. Increase in maximum width is undoubtedly related to an increased working edge span since maximum width measurements correspond to bit width in most cases. Thus, the working edges are becoming wider and thinner.

This trend has a dramatic effect on edge angles. Compared to the Palmer I sample, edge angle data for the Palmer II assemblage are much more variable, discard occurring at a much lower mean edge angle. The mean combined edge angle (combined from all three angles from each specimen) for Palmer I endscrapers is 71.02° (n = 42) while the mean for the Palmer II sample is 62.05° (n = 19). The variance of the latter sample more than doubles the former, 158.26 to 78.68 respectively. A difference of means test of combined edge angles produces a t-value of 2.74 which is significant at the .005 level with 59 degrees of freedom and unequal variances.

In summation, three observations can be made about morphological change in endscrapers. First, there is a diachronic trend towards increased expediency in the production and maintenance of endscrapers in later assemblages, as discussed by Coe (1964:73-76). This is demonstrated in the disparity of the average number of retouched lateral edges per tool between the samples. Second, the basic morphology although still within the range of variation associated with Type I endscrapers, exhibits a trend toward general size increase, edge width increase and pronounced decrease in thickness. Third, it is likely that these dimensional changes in edge morphology resulted in more variable edge angles and earlier disposal, indicated by disparity in mean combined edge angles between samples.

Since the Palmer I and II endscrapers exhibit basically the same wear patterns, variations between the samples does not relate to activity or use. Instead, the morphological shifts more likely represent changes in design constraints. As discussed previously, the morphology of endscrapers changes from relatively narrower, thicker forms to broader, thinner ones, the greatest amount of change being in flake blank selection criteria. Attention to flake morphology indicates that the Palmer I endscraper assemblage is dominated by prismatic flakes struck from prepared flake cores. The dorsal surface exhibits a central ridge flanked by one large flake scar on either side. The ventral surface is generally straight with flake thickness increasing away from the platform. By contrast the Palmer II assemblage is characterized by flakes that resemble flakes of bifacial retouch in their dorsal scar patterns and curvature. Dorsal ridges are sinuous and formed by the intersection of multiple flake scars and ventral surfaces take on a concave-convex curvature. The broader, thinner nature of these flakes indicates that they were derived from a bifacial core.

Bifaces: Fourteen bifaces or biface fragments were recovered from the Palmer II floor (see Plate 9). They occur in a variety of sizes, conditions and shapes indicative of the complex life history of this artifact category as alluded to in the endscraper discussion.

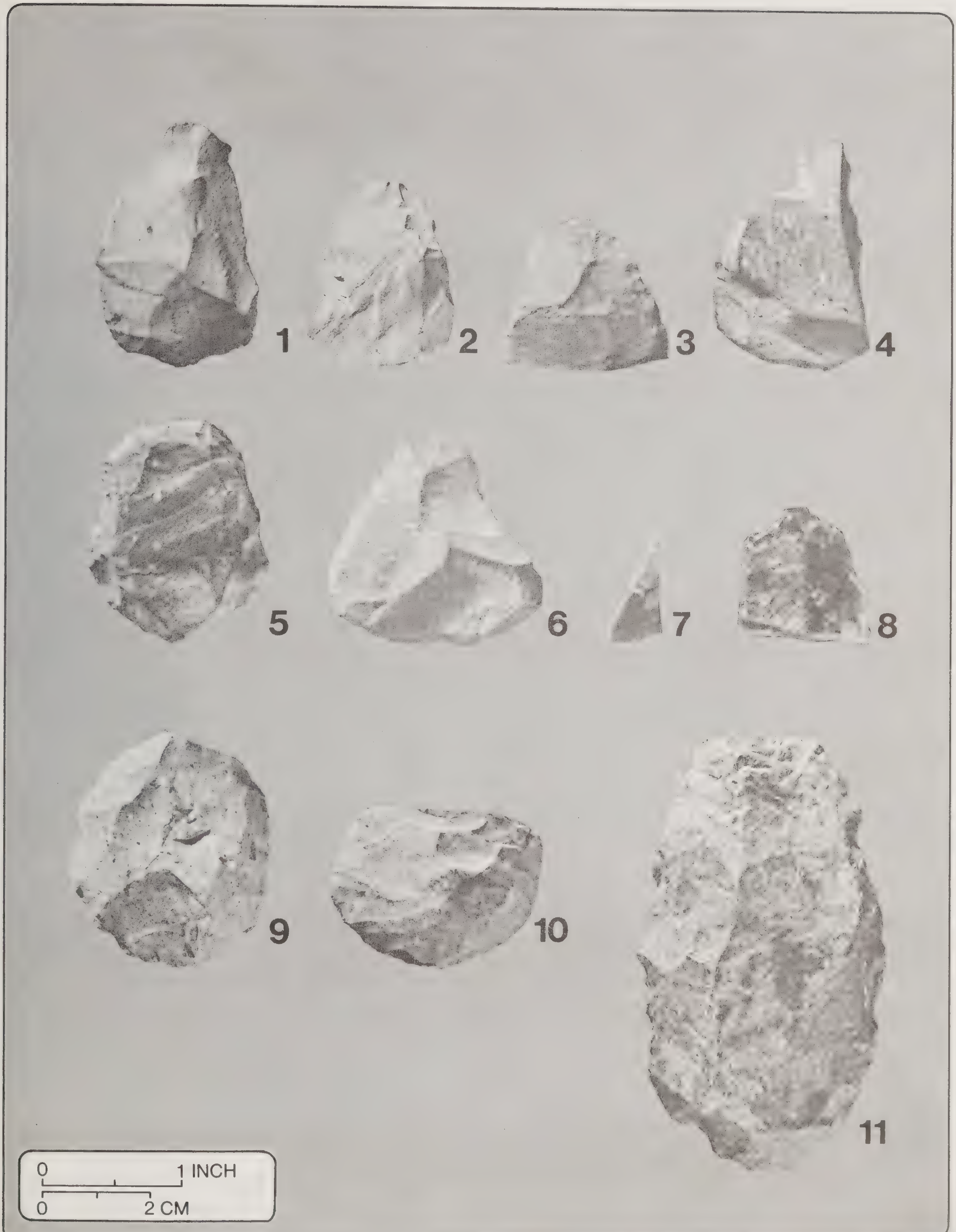
ARTIFACT PROVENIENCES – PLATE 7

PALMER II – ENDSCRAPERS (STRATUM 14/13)

1. 1.7.28.1
2. 15.9.28.7
3. 10.9.28.1
4. 7.3.26.1
5. 1.8.27.2
6. 2. .27.1
7. 13.6.26.1
8. 14.1.27.1
9. 11.5.28.2
10. 13.3.28.2

PALMER III – ENDSCRAPERS (STRATUM 12/11)

11. 4.8.24.4

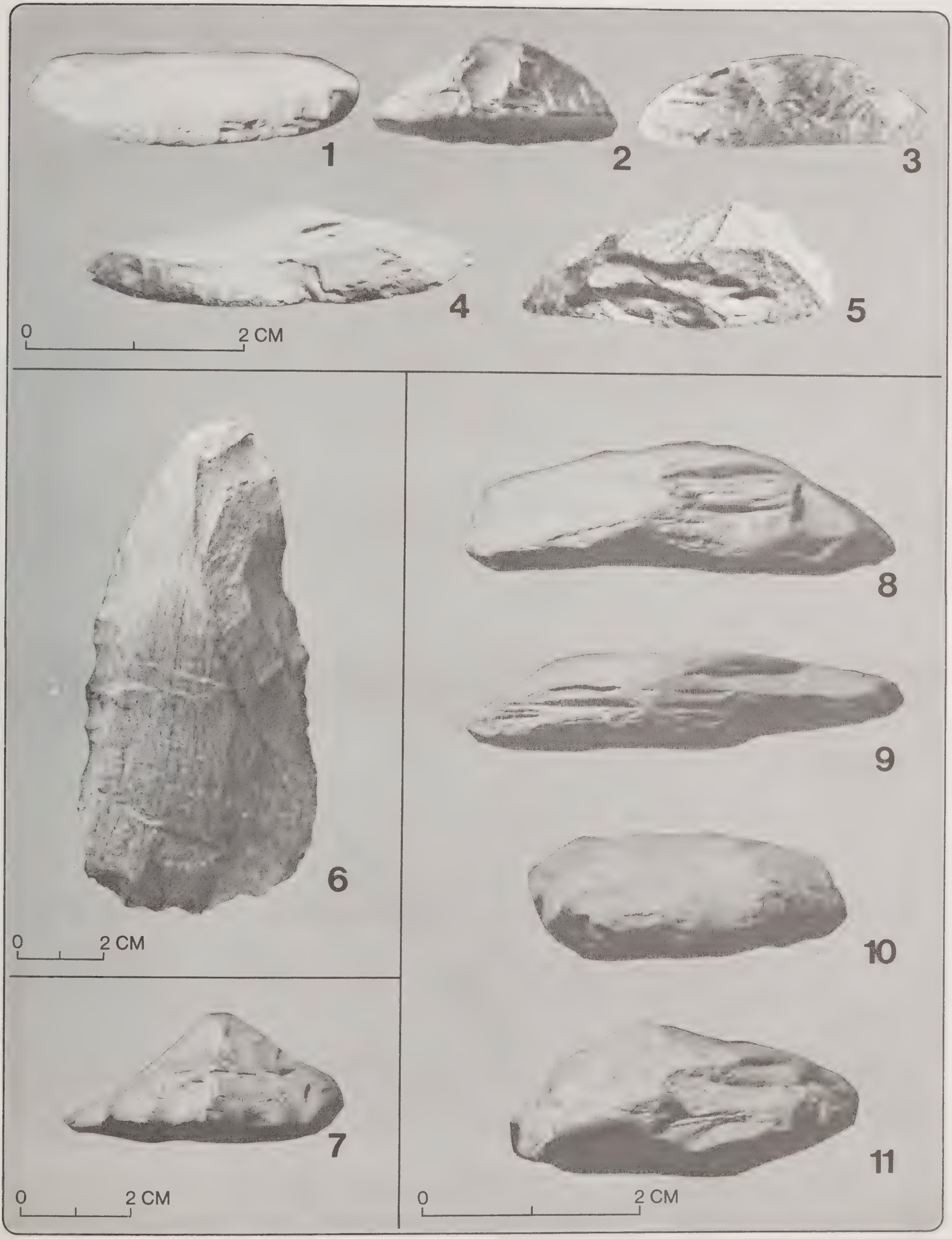


DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
COMMONWEALTH ASSOCIATES, INC

PLATE 7
PALMER OCCUPATION II
ENDSCRAPERS
31CH29-BLOCK A

ARTIFACT PROVENIENCES — PLATE 8

1. Bit of Endscraper, 7.3.26.1, showing light to moderate polish
2. Bit of Endscraper, 4.9.29.1, showing advanced polish wear on dorsal face
3. Bit of Quartz Crystal Endscraper, 14.1.29.1, showing extreme minute step fracturing
4. Bit of Endscraper, 2.8.27.1, showing minute stepping and moderate to light polish along dorsal prominences
5. Bit of Endscraper, 8.3.29.1, showing extreme step fracture damage
6. Top view of Unifacial Adze, 13.6.34.1, Hardaway-Dalton
7. View of Bit Edge of Unifacial Adze, 13.6.32.1, Hardaway-Dalton
8. Bit End of Flake Adze, 6.1.21.1, showing advanced wear from polish
9. Opposing Bit End of Flake Adze, 6.1.2.1, showing advanced wear from polish
10. Bit End of Biface, 3.2.19.3, showing moderate microtopographic alteration from polish wear
11. Bit End of Biface, 2.1.18.2, showing advanced microtopographic alteration from polish wear

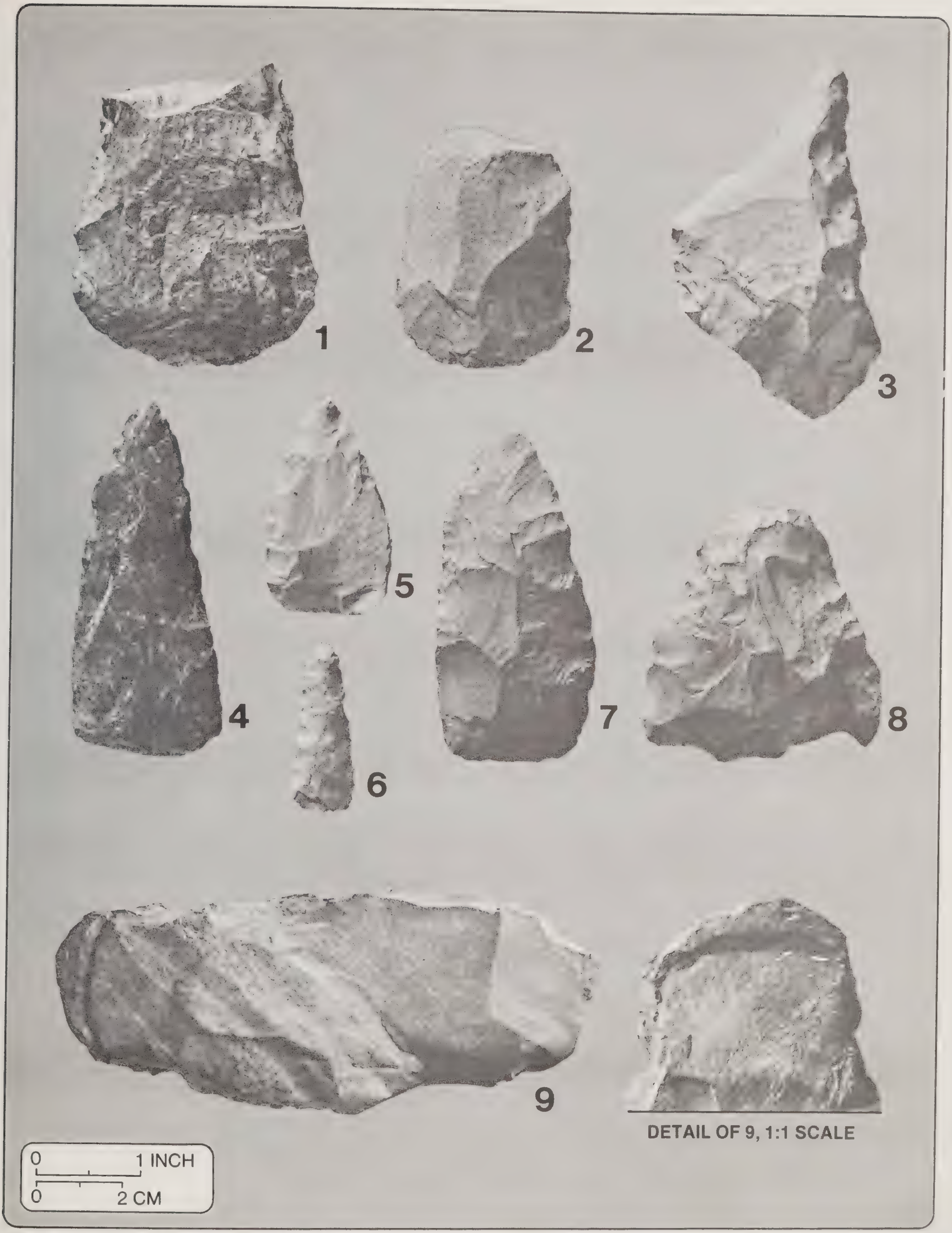


DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
COMMONWEALTH ASSOCIATES, INC

PLATE 8
END SCRAPER BITS
31CH29-BLOCK A

ARTIFACT PROVENIENCES – PLATE 9

1. 4.23.5
2. 5.27.1
3. 16.8.27.1
4. 5.25.1
5. 3.24.1
6. 10.23.1
7. 10.8.24.2
8. 15.6.26.2
9. 15.4.26.1



DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
COMMONWEALTH ASSOCIATES, INC

PLATE 9
BIFACES FROM
PALMER OCCUPATIONS
31CH29-BLOCK A

Of the fourteen bifaces from Stratum 14/13, six are sufficiently thin and small to be reasonably placed in an immediate manufacture category. Four bifaces were placed in an intermediate category since they exhibit size characteristics between the immediate manufacture category and the biface/discoid core category. The latter category consists of four bifaces presumed to have complex histories with protracted reduction stages. Two of these bifaces (16·8·27·1 and 15·6·26·2) are made of a distinctive reddish gray felsite (Raw Material 2) which serves as the source for seven flake tools as well, which provides additional confirmation for the inclusion of larger bifaces in the biface/discoid core category. One example (15·5·27·5) from the intermediate category is also made of this same material. Specimen 16·8·27·1 exhibits, as its final discard condition, a long, narrow pick-like tip. The plano-convex longitudinal section of specimen 7· ·24·1 is a typical feature of many biface cores. The flat face serves as the platform for flake production.

Table 9.7 lists the metric dimensions, condition and shape of the bifaces from this occupation floor. As mentioned above, three categories were determined according to thickness and other size considerations. The facial height ratio is calculated by dividing the height of the thinner face by the thicker face of each biface. There is a tendency for this ratio to approximate 1.00 in the immediate manufacture category and to move towards greater asymmetry (less than one) in the larger examples of the intermediate and biface/discoid core categories.

Evidence of edge rounding or dull polish occurs on none of the biface/discoid cores and on only one intermediate specimen (5·6·27·1). By contrast all but one fragment (5·2·27·3) from the immediate manufacture category showed faint to moderate edge rounding/polish along the biface edge in further support of the categorical distinctions discussed above. Faint edge rounding may occur on the tip of the pick-like biface (16·8·27·1) in the biface/discoid core category, but the pattern is by no means distinct.

II. Situational Gear from the Palmer II floor consists of flake tools and amorphous cores.

Flake Tools: This class is composed of 36 specimens that can be divided into the following categories based on characteristics of retouch and use wear: 1) Thick flakes with unifacial wear and/or unifacial retouch; 2) Thin flakes with unifacial wear and/or unifacial retouch; 3) Denticulates; 4) Serrated flakes; 5) flake adzes. Table 9.8 presents summary data on retouch, use-wear patterns, conditions and blank type for these flake tools.

The first category consists of four specimens (7·7·26·2, 16·2·27·2, 15·5·27·2, 15·7·26·3) with a mean thickness of 18.25mm. The mean angle for retouched/damaged edges is 62.17° with a range of 54° to 73°. Unifacial retouch is the predominant edge treatment. Specimen 15·5·27·2 is the only tool with an unretouched utilized edge. Functional

differentiation of edges is virtually absent in this group, with only one specimen (16·2·27·2) exhibiting more than one utilized edge. Since evidence of wear is exclusively unifacial it is possible to postulate a wood or bone scraping use.

The second category consists of 22 thin (x = 6.36mm, Range = 2 to 11 mm) flakes exhibiting either unifacial use wear or unifacial retouch. The mean central edge angle for these flakes is 42.74° for 31 utilized edges with a range of 21° to 69°. Functional variation in edges is again very slight. Specimen 5·2·27·7 exhibits two retouched edges which converge to produce a point, but all of the tools in this category are simple and show a low edge utilization rate of 1.41 edges per tool similar to the first category (1.50 edges per tool).

The predominance of low edge angles would suggest that this tool group represents cutting implements (see Wilmsen 1970). The unifacial nibbling wear on these specimens is consistent with Keeley's (1980:54) observations concerning meat-cutting wear patterns: "The utilization damage on meat-cutting or butchering edges, when it occurs, usually consists of scattered *Microstep* and *Micro D* scars which tend to occur primarily on the dorsal aspects."

Flake blanks for this category are dominated by flakes of bifacial retouch (11) and central ridge FBRs (5). Blanks indicative of earlier stage biface reduction composed only a small proportion of the assemblage. Two discoidal core flakes and one side-struck flake of biface core reduction were used to produce tools, while origins of the remaining three flakes were indetermniate.

Four of the flake tool specimens exhibit denticulated edges and are sorted into a separate class of tools based on this attribute. Two of the tools are made from central ridge FBRs and the other two are made from side-struck flakes of biface core reduction. The former two have central edge angles of 35° to 36° and the latter two exhibit angles of 49°, 52° and 51° on the denticulated edges. Functional differentiation based on edge form again is low in this group which contains five denticulated edges and one unifacially retouched edge with an edge angle of 54°. The edge utilization rate is 1.50 edges per tools. The denticulated edge outline on these specimens would suggest a sawing or cutting use.

Five tools (13·9·29·2, 15·5·27·3, 10·7·28·8, 8·3·26·3 and 1·8·27·1) exhibit serrated edges. In all of these cases retouch was applied unifacially with ridge protusions between retouch scars spaced about Imm apart. The mean thickness for this group is 6.8mm which is comparable to the average for the thin unifacial flake tool category. Three of the specimens (10·7·28·8, 8·3·26·3 and 1·8·27·1) exhibit two utilized edges: a unifacially retouched edge with an angle of 54°, an edge exhibiting unifacial nibbling damage with an angle of 44° and a denticulated edge with an angle of 59° respectively. The edge utilization rate for this group is 1.6, slightly higher than the other categories.

Table 9.7 Data on the Bifaces from Occupation Floor 14/13

Biface Category	Condition	Shape	Length (mm)	Width (mm)	Thickness (mm)	$\frac{H_S}{H_L}$
Immediate Manufacture						
12·1·25·1	Whole	Ovate	42	33	7	.75
10·4·26·3	Whole	Ovate	35	25	8	1.00
5·9·26·1	Whole	Ovate	40	22	10	1.00
10·2·26·1	Whole	Discoid	47	43	9	.22
13·5·27·2	End Fragment	Ovate			9	
5·2·27·3	End Fragment	Ovate			6	
Intermediate						
15·5·27·5	End Fragment	Ovate		52	10	.67
5·6·27·1	Whole	Subrectangular	57	41	14	1.00
1·8·27·5	End Fragment	Ovate		37	11	.83
1·8·25·3	End Fragment	Ovate		33	15	.33
Biface/Discoid Core						
7·4·24·1	Whole	Ovate	81	45	25	.56
16·8·27·1	Whole	Pick	80	62	22	.83
6·6·24·1	End Fragment	Ovate Tip			14	.56
15·6·26·2	Whole	Subtriangular	61	59	14	1.00

Biface Category	Condition	Shape	Length (mm)	Width (mm)	Thickness (mm)	Height Index	Edge Polish
Immediate Manufacture							
3·9·24·1	Whole	Ovate	51	30	7	.40	X
10·7·23·1	Whole	Lanceolate	41	15	5	.67	X
1·2·24·8	Fragment				6		Quartz Nibbling
2·5·22·4	Fragment	Subrectangular			3	1.00	X
3·3·24·4	Fragment	Subrectangular			4	.33	X
13·9·23·1	Whole	Ovate	38	24	10	.67	X
13·9·24·1	End Fragment	Ovate			7	.40	X
Intermediate							
11·5·25·1	Whole	Lanceolate	85	36	10	1.00	X
10·8·24·2	Whole	Lanceolate/Ovate	80	38	10	1.00	X
11·3·24·3	End Fragment	Ovate	50	26	15	.67	Quartz Nibbling
1·8·24·4	End Fragment	Ovate		45	16	.14	Quartz Nibbling
10·3·24·1	End Fragment	Subrectangular			10	.25	
13·7·23·4	End Fragment	Ovate		33	14	.56	
1·2·24·1	End Fragment	Ovate		34	9	.50	X
12·1·25·1	Fragment	Subrectangular			10	.67	X
15·5·24·1	Fragment	Ovate			10	1.00	X
3·8·24·5	Fragment				12	.33	

Biface Category	Condition	Shape	Length (mm)	Width (mm)	Thickness (mm)	Height Index	Edge Polish
Biface/Discoid Core							
2·6·25·2	Whole	Ovate	98	58	30	.50	X
4·9·23·5 (Conjoined with 11·1·25·2)	Whole	Ovate	100	59	14	1.00	
3·4·23·2 (Conjoined with 7·9·24·2)	Whole	Ovate	80	52	11	.38	
3·8·24·6	Tip	Ovate			12	.50	X
13·1·25·3	End Fragment	Ovate			22	.69	

Table 9.8 Summary Statistics for Lamellae 14/13

	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Uni Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Uni Ret	Missing	Flake	Cortex	
11·5·28·2			D-D D-LL				RL				3			W	Thick FB	3	ES
1·7·28·1							D RL LL				3			W	PRIS Flake	3	ES
13·3·28·2			D-D D-LL D-RL								3			P	PRIS Flake	3	ES
10·9·28·1			D-LL D-RL								2			D	PRIS Flake	3	ES
1·8·27·2			D-LL D-RL D-D D-P								4			W	PRIS Flake	3	ES
7·3·26·1			D-D				LL				2			RL	PRIS Flake	3	ES
2·1·27·1			D-D D-LL				RL				3			W	PRIS Flake	3	ES
14·1·27·1			D-RL								1			D	PRIS Flake	2	ES
13·6·26·1			D-D								1			P,LL, RL	I	3	ES
15·9·28·7							D				1			W	FBR	3	ES

	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Uni Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Uni Ret	Missing	Flake	Cortex	
15·7·26·3			D-LL								1			RL	Thick FB	1	
15·5·27·2							LL				1			W	Thick FB	2	
16·2·27·2			D-D D-RL D-LL								3			W	PRIS Flake	2	
7·7·26·2			D-LL								1			RL	DF	3	
10·1·27·1			D-RL		LL P	D					4			W	Thick FB	3	AX
13·9·29·2				D-LL							1			W	FBR	3	
14·5·27·2		V-LL									1			D	CR FBR	3	
15·4·28·1		D-LL	D-RL								2			W	CR FBR	3	
1·7·28·2							RL LL D				3			W	FBR	2	
10·7·28·8			D-LL	D-RL							2			W	FBR	3	
16·1·26·3			D-RL								1			P,D	CR FBR	3	
15·5·27·3				D-LL							1			W	CR FBR	3	
14·8·28·3							RL				1			LL,D, P	FBR	3	

	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Uni Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Uni Ret	Missing	Flake	Cortex
14·6·29·5							RL				1			LL,D, P	FBR	3
14·7·26·1							RL,LL				2			P	FBR	3
5·7·27·6							RL				1			P	DF	2
7·8·28·2			V-D								1			P	FBR	3
10·7·28·9						RL					1			P,D, LL	FBR	3
10·9·27·4						RL					1			D,LL	CR FBR	3
10·1·28·3									RL		1			W	FBR	3
5·2·27·7			D-LL D-D D-RL								4	Point D/LL		W	FBR	3
11·6·26·2						LL D					2			P	I	2
16·6·27·6			D-RL				LL				2			D	CR FBR	3
5·1·27·5							LL				1			W	FBR	3
8·3·26·3				VD-LL			LL				2			W	CR FBR	2
1·8·27·1		V-LL		U-V-D							2			P	FBR	3
14·8·28·2			D-LL								1			W	FBR	3
15·7·28·6			D-RL								1			D	BCRF	3

	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Uni Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Uni Ret	Missing	Flake	Cortex
15·4·29·1			D-LL D-D								2			P,RL	FBR	3
6·6·26·1		D-LL			RL						2			W	BCRF	3
6·7·27·2									RL		1			W	CR FBR	3
15·4·27·4			D-LL								1			P,RL, D	DF	3
11·2·25·1							D				1			P,LL	I	3
13·3·27·1							RL LL				2			P,D	I	3
13·7·27·3		D-LL D-RL									2			W	BCRF	3
8·1·25·4			D-LL				RL				2			D,P	CR FBR	3

The final flake tool category consists of a single artifact identified as an ax made of a soft meta-siltstone which clearly shows wear patterns. It was originally cataloged as two separate artifacts, specimens 10·1·27·1 and 15·4·26·1. Specimen 15·4·26·1 is a distal end fragment of a broken artifact, and exhibits heavy polish along the bifacially retouched edge. Polish and striations extend onto one face of the fragment. The conjoined tool is manufactured from a long, thin (126mm x 54mm x 10mm) flake shaped by bifacial retouch. A large, thin fracture at the distal end removed evidence of retouch and wear. The dorsal surface of the tool exhibits extensive evidence of semi-matte polish, most pronounced on prominences, and striations running roughly parallel to the long axis of the tool. The striations tail-off toward the proximal end of the tool and angle downward approximating the ax trajectory described by Semenov (1964:126). These same wear characteristics are present on the ventral surface in the few areas still exhibiting the original surface. The lateral and proximal edges are marked by extensive polish which is again most pronounced on prominences. The distal edge received extensive damage from the cleaving of a spall (15·4·26·1) along the ventral surface which extended across two-thirds of the longitudinal axis of the flake. The resultant thin edge showed slight polish, with unifacial nibbling across the ventral face. The thinness of the tool suggests that it would not be ideal for heavy wood cutting, but would be suitable in the case of lighter duty chopping in butchering.

Compared to the flake tool assemblages of lamellae 16 and 15, the lamellae 14/13 assemblage is becoming more diverse and functionally segregated.

Number of Edges Used per Flake	13/8 or 1.63	52/27 or 1.93	58/36 of 1.61
Number of Different Uses per Flake	9/8 or 1.13	32/27 or 1.19	42/36 or 1.17
Number of Functional Categories	2	4	6

A possible third category is represented by the unifacial adz discussed as part of the personal gear. Functional categories were differentiated on the basis of the following combinations of wear/retouch characteristics:

1. Unifacial retouch and/or unifacial nibbling and edge fracture
2. Bifacial marginal retouch and/or bifacial nibbling
3. Denticulate retouch
4. Scalloped retouch
5. Serration retouch
6. Various tool combinations (i.e. notch, point, graver, etc.)
7. Axes, adzes, chisels and other chopping implements

Each different tool combination (6) or chopping implement (7) is counted as a separate functional category.

It can be concluded from Table 9.9 that the trend toward a greater functional diversity of flake tools is accomplished not by an increase in the complexity of an individual flake tool, but an increase in functionally discrete classes of tools. The number of different uses per flake tool remains relatively small with averages just above one function per tool. Also, there do not appear to be patterns of recurrent functional combinations on individual flakes. It is just as probable that a serrated edge will occur with a denticulate, bifacially retouched, or a unifacial edge. The increase in the average number of edges used per tool for the Palmer I assemblage may be due to site-specific differences rather than an evolutionary trend, but it is interesting to note that this increase is not accompanied by a similar increase in individual tool complexity. This would suggest that flake tools performed exclusive tasks (i.e. cutting meat, scraping wood, chopping wood, whittling, etc.), followed by tool discard.

The lamella 16 assemblage (Hardaway-Dalton) is overwhelmingly made up of unifacial tools, with one item from functional category 2 (chisel), and one personal gear item, the unifacial adz, which would represent category 7. The Palmer I (lamella 15) flake tool assemblage is again dominated by unifacial tools. The other functional categories are represented (serration, bifacial marginal retouch, a notch and a large chopping implement), but most of these categories are not easily segregated from the unifacial category. The serrated edge on specimen 14·9·30·2 is associated with two unifacially retouched edges. Bifacial retouch/nibbling occurs in association with unifacial nibbling on specimen 14·6·31·1, with two unifacially retouched edges on specimen 16·1·28·1, with unifacial nibbling on specimen 2·7·29·12 and with unifacial retouch, unifacial nibbling and notch on specimen 2·7·29·8. This leaves only two flakes from this category which are purely bifacial. Thus, most of the functional or use variability in the Palmer I floor is embodied in the general unifacial character of the flake tool assemblage.

The Palmer II assemblage is also dominated by unifacial tools, but the representation of other edge forms is greater. The relative proportions of edge characteristics for the three occupations are listed below. Again, there is no clear pattern of co-occurence of edge types, but the unifacial component of the assemblages decreases in importance between Haraway-Dalton and Palmer II as diversity of edge types increases. Denticulated and serrated edges in particular take on more importance.

	Denticulate	**Unifacial**	**Serrated**	**Bifacial**	**Combinations**
Hardaway-Dalton Lamella 16		(11) .92			(1) .08
Palmer I Lamella 15		(43) .83	(1) .02	(7) .13	(1) .02
Palmer II Lamella 14/13	(6) .10	(43) .74	(5) .09	(3) .05	(1) .02

Table 9.9
Functional diversity of flake tools
Lamella 16, 15, 14/13

Lamella 16	Scal	Dent'	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex	
13·6·34·1			D-LL D-RL		D						3			W	Thick FB	2	ADZ
4·5·35·3			D-RL D-D								3	Grauer Spur D/RL		W	Thick FB	2	ES
13·1·32·2			D-RL D-LL D-D								3			P	PRIS Blade	2	ES
14·2·32·2			D-RL D-LL D-D								3			W	PRIS Flake	3	ES
13·2·32·1			D-D D-RL		D-LL						4	Notch D/RL		W	PRIS Flake	3	ES
12·7·31·1			D-RL D-LL								2			D	CR FBR	3	ES
2·5·33·1			D-LL		D-RL						2			D	FBR	3	ES
2·7·31·1			D-LL D-D								2			RL	Thick FB	1	ES
12·6·30·1			D-LL		D-D						2			P	Thick FB	2	Chisel
10·4·31·1			D-LL								1			W	BCRF	2	

Lamella 16 (Cont'd.)	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex
3·1·33·1			D-LL								1			P	Thick FB	3
10·6·30·2			D-RL D-D								2			W	FBR	2
13·2·33·1							RL D				2			W	FBR	3
14·2·32·1							LL		LL		2	Notch V-RL			FBR	3
6·2·30·6			D-LL D-D								2			W	FBR	1
14·2·33·1								LL			1			W	FBR	1
Lamella 15																
F-52 2·7·29·8			V-RL		D		RL				4	Notch D-RL	LL	W	Thick FB	2
F-52 2·7·29·11					RL					LL	2			W	Thick FB	3
F-52 2·7·29·9						LL RL					2			W	Thick FB	2
F-52 2·7·29·12					D	LL					2			W	Thick FB	3
F-52 2·7·29·6							LL				1			W	BCRF	3
f-52 2·7·29·5			D-LL								1			W	BCRF	3

Lamella 15 (Cont'd.)	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex	
10·2·30·2					LL						1			W	Thick FB	2	Chopping Imp.
3·1·29·1			D-LL								2			RL	DF	2	
16·1·28·1			D-D D-LL		RL						3			W	DF	3	
16·4·28·6			D-LL								1			W	DF	3	
16·7·28·8			D-LL D-RL								2			W	BCRF	3	
16·9·27·3			D-LL								1			W	DF	3	
10·8·29·3			D-LL				P				2			W	BCRF	2	
16·9·28·3			D-LL D-RL								2			W	DF	2	
5·9·29·1							RL				1			W	DF	2	
7· ·29·1			D-RL								1			P,LL D	I	2	
16·4·27·8			D-LL D-RL				D				3			W	CR FBR	2	
14·6·30·3			D-RL D-D				LL,P				4			W	CR FBR	3	
14·9·30·2			D-D D-LL	D-RL							3			P,RL	I	1	
14·8·29·6			D-LL								1			W	DF	3	

Lamella 15 (Cont'd.)	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex
14·6·31·2			D-LL D–RL								2			D	FBR	3
16·3·30·1			D-LL				D				2			P,RL	FBR	3
4·4·28·1							RL,LL				2			W	CR FBR	3
11·1·29·1							RL,LL		RL		2			D	FBR	3
2·6·30·1							RL				1			LL	I	3
14·6·31·1							RL			LL	2			D	BIP	2
13·1·30·1							RL,LL				2			P	FBR	3
Lamella 14/13																
14·1·29·1			D-D D-RL D-LL								3			W	PRIS Flake	3 ES
14·4·29·2			D-D D-RL D-LL								3			P	PRIS Flake	3 ES
4·9·29·1			D-D D-RL D-LL								4	Grauer Spur RL/D		W	PRIS Flake	3 ES
8·8·29·2			D-D D-RL D-LL								5	Graver Spurs (2) RL/D LL/D		W	FBR	2 ES

Lamella 14/13 (Cont'd.)	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex
13·5·29·3			V-LL D-RL D-D								5	Notches U-D-RL U-V-LL		W	PRIS Flake	2 ES
15·5·29·2			D-D D-LL								3	Graver Spur D/LL		W	PRIS Flake	3 ES
15·5·29·3			D-LL D-RL								2			D,P	I	3 ES
14·2·29·3			D-RL D-LL D-D								3			P	PRIS Flake	2 ES
8·3·29·1			D-D D-RL D-LL								3			W	DF	3 ES
8·4·28·2			D-D D-RL D-LL								4	Graver Spur D/RL		W	PRIS Flake	3 ES
16·4·28·5			D-D D-RL D-LL								3			W	PRIS Flake	3 ES
16·5·28·7			D-D D-RL D-LL								3			W	PRIS Flake	3 ES
12·2·27·1			D-D D-LL								2			W	PRIS Flake	2 ES
12·2·27·2			D-D D-RL								2			W	DF	ES

Amorphous Cores: Four large chunks of raw material have been lumped into this miscellaneous class of artifacts. Specimen 15·6·28·2 is made of a felsic porphyry (Raw Material G) and weighs 157 grams (80 x 51 x 34mm). It appears to represent a block core fragment. Specimens 13·6·28·1 and 16·26·2 are large, blocky flakes manufactured from latite tuff (Raw Material O) and quartz (Raw Material F) respectively. The former core weighs 88 grams and has dimensions of 58 x 61 x 25mm. The latter example weighs 101 grams and has dimensions of 56 x 52 x 29mm. Specimen 3·8·28·1 is river worn, tabular piece of andesetic felsite (Raw Material B); one end has been removed. It weighs 481 grams and measures 86 x 77 x 40mm. These cores show no positive evidence of use and, as such, may represent *de facto* refuse in Schiffer's (1975:266) terminology: "items not curated, but still useable when abandoned."

III. Site Furniture from the Palmer II occupation consists of two quartzite cobble tools. Specimen 16· ·27·5 is broken cobble with edge battering at one end extending for approximately 55mm. A large spall was cleaved from one battered side. Remnants of heavy edge abrasion occur along one lateral edge. Specimen 14·3·28·1 (see Plate 19) exhibits pitting on both faces and pronounced abrasion along both ends. The lateral margins are unaltered. The former specimen weighs 504 grams with dimensions of 82 x 80 x 55mm and the latter specimen weighs 531 grams and measures 91 x 73 x 49mm.

The wear characteristics of these two cobble tools, and the proximity in which they were found, argue for their functional relatedness. Specimen 16· ·27·5 has one pounding edge and one abraded edge, while specimen 14·3·28·1 exhibits two pitted or anvil surfaces and two abraded surfaces. It is unlikely that the anvil is associated with bipolar flake manufacture, since bipolar debitage is rare anywhere in the stratigraphic sequence of the site and altogether absent from lamella 14/13. One alternative use for such items is bone crushing to obtain bone juice or grease.

Bone juice is manufactured by the Nunamiut to correct the fat and grease deficit in their diet brought about by heavy reliance on stored dried meat from spring-killed caribou. This dietary deficiency cannot be corrected by marrow consumption, since marrow storage is very difficult. Binford (1978a:163-164 and 157-158) describes examples of bone juice and grease processing among the Nunamiut, involving the crushing and boiling of articular bone segments. The implements needed for this undertaking are a blanket, anvil, a "Kaotah" (axe/hammerstone), pots and a ladle. By-products are broth, grease, pulverized or splintered bones and wood ash/charcoal.

Spears (1975) has experimentally determined that items like cobble forms found at Haw River may have been used prehistorically for cracking nuts or as anvils needed for bipolar lithic production. Other archeologists have inferred similar functions for prehistoric analogs. Cobble tools often are assumed to be connected with activities of seed grinding,

nutcracking or stone knapping; this discussion provides a viable alternative explanation for the use of such items during the Early Archaic substage within the contexts of butchering processing of game animals.

Lamellae 12/11 – Palmer III Occupation

I. *Personal Gear* consists of three tool classes: 1) projectile points; 2) endscrapers; and 3) bifaces.

Projectile Points: The Palmer III projectile point assemblage consists of nine diagnostic specimens (see Plate 10) and four unidentifiable fragments (3 tips and 1 lateral section). The general size increase noted in the comparison of Palmer I and Palmer II points continues with this assemblage. Table 9.10 compares central tendency statistics of the metric dimensions of Palmer III points with points from the earlier occupations.

Table 9.10
Metric Data for Palmer Points
From the PI, PII and PIII occupations

Size Dimensions (mm)	Palmer I			Palmer II			Palmer III		
	n	$\overline{x}$	s	n	$\overline{x}$	s	n	$\overline{x}$	s
Max. Thickness	7	6.14	0.64	7	6.29	0.88	9	7.11	1.10
Base Width	6	21.17	4.06	5	25.20	3.76	8	28.00	3.67
Tang Width	6	16.17	2.73	6	19.67	2.47	6	20.67	2.75
Shoulder Width	7	23.43	3.02	7	29.71	6.09	7	36.00	3.70
Tang Length	6	9.83	1.21	6	10.17	2.34	7	11.14	2.59
Blade Length	7	33.14	6.13	6	34.83	12.98	7	38.86	8.71

Although the general "across-the-board" increase in size occurs, it has already been demonstrated that some elements of Palmer points take on a more significant increase than others. It was shown earlier that the significant increases were principally related to the elements most directly associated with width (ie. base, shoulder and tang width). Length measurements of elements (ie. blade and tang length), by contrast, were not greatly affected by whatever causal forces were moving the design of Palmer Corner-notched points along a trajectory of increasing width. Table 9.11 displays the results of two sample t-test comparisons between the Palmer III point sample and the Palmer I and II samples.

The first observation to be made is that length continues to be unaffected by design change. Both t-tests results comparing Palmer II and III points are insignificant for tang and blade length. The major change again occurs in shoulder width as a significant increase is

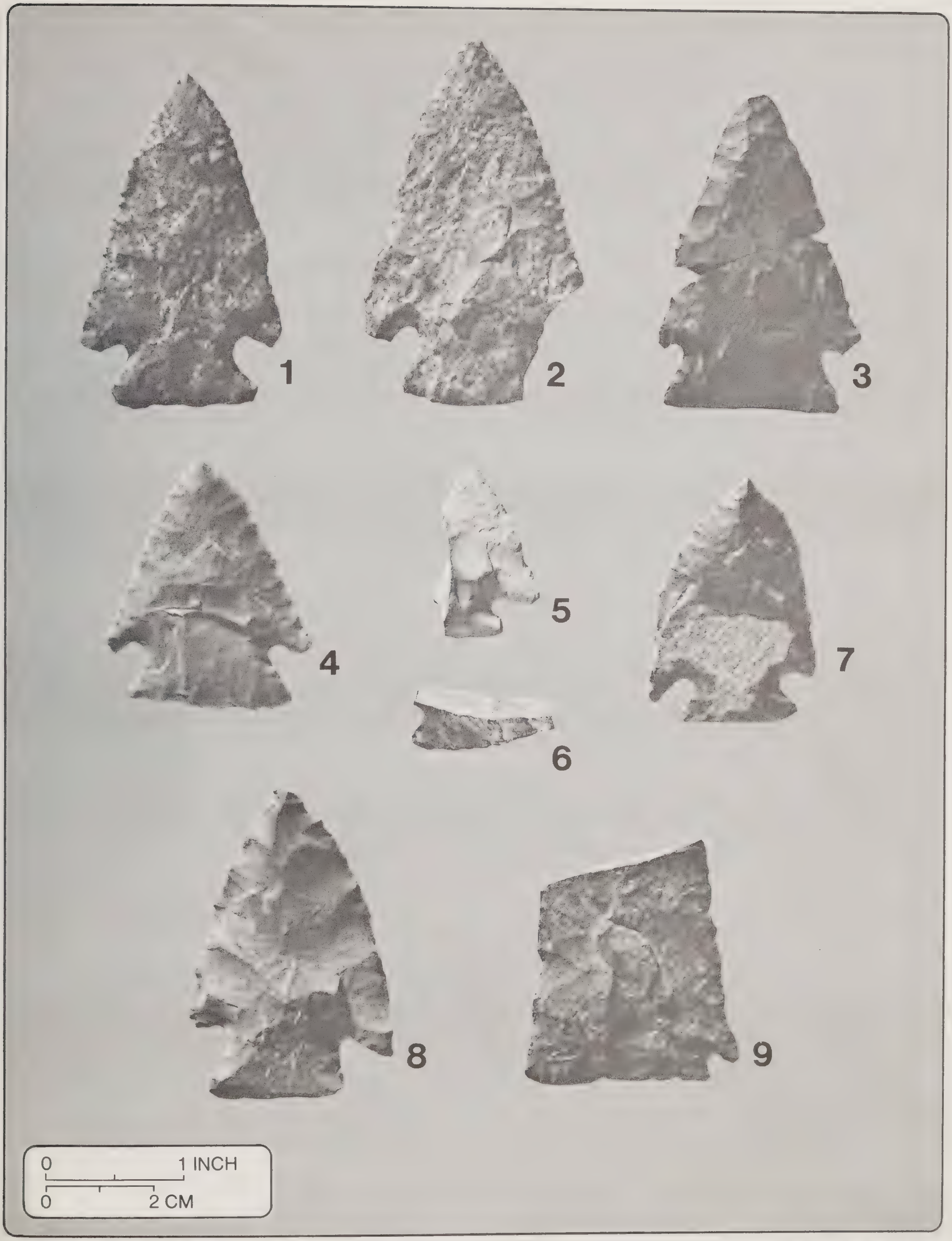
Table 9.11
Results of t-tests of metric data
comparing the projectile points from
Palmer I, II, and III occupation floors

	Comparison of Palmer II to Palmer III Group			Comparison of Palmer I to Palmer III Group		
Metric Dimensions	Pooled Variance	t-Value	Probability	Pooled Variance	t-Value	Probability
Maximum Thickness	0.5439	1.507	$.10 > P > .05$	0.4996	1.942	$.05 < P < .025$
Base Width	1.1927	2.348	$.025 > P > .01$	2.2412	3.048	$P = .005$
Tang Width	1.0218	0.979	$P > .10$	1.7329	2.597	$.025 < P < .01$
Shoulder Width	1.2774	4.924	$P < .001$			
Tang Width	0.9514	1.020	$P > .10$	1.1878	1.103	$P < .10$
Blade Length	2.0119	0.592	$P > .10$	4.3482	1.315	$P < .10$

ARTIFACT PROVENIENCES – PLATE 10

PALMER III – PROJECTILE POINTS (STRATUM 12/11)

1. 8.2.23.2
2. 12.1.25.2
3. 8.6.23.1 & 8.9.26.2
4. 12.   .25.4
5. 4.1.24.1
6. 2.3.22.1
7. 3.3.24.3
8. 2.6.22.2
9. 2.3.24.1



DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
COMMONWEALTH ASSOCIATES, INC.

PLATE 10
PALMER OCCUPATION III
PROJECTILE POINTS
31CH29-BLOCK A

registered between Palmer II and III. Base width also changes significantly. However, tang width, which exhibited significant change between Palmer I and Palmer II, appears to have stabilized by the Palmer III occupation. Another dimension, thickness, which was not demonstrated to represent a significant increase between Palmer I and II, shows a definite tendency to increase between Palmer II and III. A clear statistical break in the central tendency of thickness is shown by a comparison of the Palmer I and III samples. The results of this t-test are significant at the .05 probability level indicating that thickness was slowly and gradually increasing throughout the Palmer phase.

The mean size measurements of the Palmer III point sample are just slightly less than the averages reported by Coe (1964:70) for the Kirk Corner-notched type at the Hardaway site. Means for the latter collection are 60mm for axial length, 30mm for width and 8mm for thickness compared to 50mm, 28mm and 7.11mm respectively for the Haw River Palmer III sample. These results are consistent with the argument presented earlier concerning typology and the nature of occupation residues. There are limitations to typological schemes which are based on single portions of time in a dynamically changing technological system. It is no wonder, then, that archeologists are continually confounded by the "transitional type." Often, this is experienced as a geographic problem, but the Haw River data show that it is equally a problem of local development and adaptive change. It is tempting to contemplate the results of further excavation at 31Ch29. We might dig the entire site and *still* not be able to establish a definitive Kirk Corner-notched type. Instead we might conceivably produce a sequence describing every little nuance of change between Palmer and Kirk Corner-notched points except the final deletion of basal grinding. Certainly, the presence or absence of basal grinding is a significant attribute to monitor, but the change is not as clear-cut as Coe would suggest. There is rather a gradual sequence of change not unlike the metric attributes previously discussed. By the Palmer II occupation basal grinding shifted from an intense to a light manifestation. In both the Palmer I and II occupations heavy basal grinding occurs on 5 or 6 points; in each occupation, the remaining examples exhibit light grinding. In the Palmer III sample, however, light grinding is present on 78 percent of the points (7 of 9) while the remaining 22 percent is characterized by heavy grinding.

The directional and gradual changes which characterize the developmental sequence of early corner-notched points argue strongly that the typological distinctions between Palmer and Kirk corner-notched points are not useful in their present form. What has been demonstrated is that these two types represent the idealized and dichotomous points within a directional sequence of change in a single design tradition. This claim is further supported by the change in projectile point design which characterizes the next occupation of Block A (This will be discussed in detail below). Although it is useful to observe dynamics of attribute change within this design tradition, splitting its members into two types can only confuse the issue. It is conceivable that by close monitoring of attribute change in artifacts

from excavated contexts, a system of relative dating may be developed to locate projectile points from surface collections or other sources on a gradient of directional change. Such a system would allow identification more accurate than the present typological scheme without ignoring the functional interrelatedness of the points within a design tradition. Therefore, it is argued here that the typological unit Kirk Corner-notched be eliminated. This would clear up the confusion surrounding the relationship between the large corner-notched points and the later projectile point forms identified as Kirk stemmed and Kirk serrated (Coe 1964:70) and the small Kirk corner-notched variants (Chapman 1977:44-47), while maintaining an important adaptive link between the projectile points of this single design tradition.

Endscrapers: A total of 16 endscrapers were recovered from lamella 12/11. Five of these specimens (8·6·25·1, 8·7·22·1, 2·1·23·2, 4·1·24·1 and 11·8·24·) represent only the butt ends of endscrapers. Specimens 4·3·23·1 and 11·8·24·1 are bit end fragments and 13·5·25·2 (a bit end) was refit with 13·5·30·4 which was vertically displaced downward, by some disturbance factor, into the lamella 15 occupation floor. The remaining 8 endscrapers were whole.

Table 9.12 displays summary statistics on the metric dimensions and edge angle measurements for the endscraper samples from the three Palmer occupation floors.

Table 9.12
Statistics on the endscraper samples from the Palmer I, II and III occupation floors

	Palmer I			**Palmer II**			**Palmer III**		
Metric and Edge Angle Data	n	$\overline{x}$	s	n	$\overline{x}$	s	n	$\overline{x}$	s
Width (mm)	14	28.78	4.21	8	32.50	4.40	16	30.93	6.10
Length (mm)	11	32.45	6.47	6	37.00	5.23	11	43.64	14.11
Thickness (mm)	14	10.82	1.92	10	8.60	2.16	16	9.63	2.12
Weight (gm)	11	9.64	4.33	8	12.57	3.74	11	16.55	13.36
Edge Angle 1°	14	71.57	9.21	6	60.67	14.40	11	64.82	11.45
Edge Angles 2°	14	74.36	10.49	7	57.29	8.96	11	67.09	15.32
Edge Angles 3°	14	67.14	6.91	6	69.00	14.99	11	62.82	10.98
Combined Edge Angle °	42	71.02	8.87	19	62.05	12.58	33	64.91	12.58

Although some trend reversals can be identified in the size parameters of endscrapers between the Palmer II and III occupations, these do not appear to have statistical signifi-

cance. One-tailed, two sample difference of means tests (see Blalock 1972:220-228) comparing the Palmer II and III samples for metric and edge angle data indicate that significant differences between the samples cannot be demonstrated. The t-values and probabilities for width, length thickness, weight and combined edge angle are .5708 ($p>.10$), 1.4654 ($.10>p>.05$), 1.3180 ($p>.10$) and .8934 ($P>.10$) respectively. The basic pattern remains the same; design constraints continue to be loosened. In fact the standard deviations of weight and length for the Palmer III sample demonstrate increased morphological variation over the Palmer II sample.

It was argued earlier that the loosening of design constraints in endscrapers could be attributed to a decrease in the importance of the tool itself. This would decrease the need to curate endscrapers. This in turn, could entail a more expedient or situational context for endscraper production. Two consequences for design arise from this shift in importance. First, the character of the manufacturing blank shifts toward expedient biface core flake production. Second, the effort expended in shaping and maintaining the tool decreases.

The first consequence can be demonstrated by observation of the technological attributes of endscraper blanks. Table 9.12 indicates that blank selection is moving toward longer, broader and thinner flakes. This observation in itself strongly suggests a shift toward biface flake blank production. A comparison of platform morphologies adds further support for this propositon. Platforms on endscraper blanks were generally unaltered in the samples and provide excellent technological information on flake production. Two basic platform morphologies exist: 1) a generally wide, unfaceted platform and 2) a thin, biconvex faceted platform. The second platform type is indicative exclusively of biface flake production, while the former type is indicative of discoidal or early stage biface reduction. The major difference in the resultant blank types probably relates to standardization and control rather than to a distinct difference in flake production technique. Discoidal blank production is controlled by carrying the force along central ridges and flake production can become fairly standardized given these parameters. Flake production from later stage bifaces should be less standardized because of the more complex scar pattern associated with the surface of a biface. Thus, we might expect the discoidal platform to be associated with the more standardized assemblage of the Palmer I sample and the biface platform to be associated with the more variable blanks of the Palmer I and II samples. Comparison of the observable platforms from the three samples supports this expection. In the Palmer I sample 55 percent (6 of 11) of the observable platforms are discoidal. This contrasts with only 14 percent (1 of 7) for the Palmer II and 27 percent (3 of 11) for the Palmer III samples.

Although the Palmer II sample shows a decrease in lateral shaping compared to the Palmer I sample (1.2 and 1.71 retouched lateral edges per tool respectively), the Palmer III sample exhibits the highest lateral shaping index, with an average of 1.80 (n = 30) retouched lateral edges per tool. One possible explanation is that lateral shaping may not be related to curational strategies at all, but simply to producing a suitable shape for hafting. Edge angle

data tend to support such an interpretation. A difference of means test for combined edge angle data for the Palmer II and III samples establishes that these samples do not exhibit significant differences, but both are significantly smaller than the Palmer I sample. Thus, the mean discard edge angle is considerably lower and more variable in the two later samples, a pattern which is perhaps indicative of decreased maintenance effort and a more immediate discard behavior.

Bifaces: a total of 22 whole or fragmentary individual bifaces were recovered from the Palmer III occupation floor. Two of the bifaces are represented by conjoined pieces. Specimens 11·1·25·2 and 4·9·23·5 comprise one whole biface and were horizontally separated by nearly seven meters. Specimens 3·4·23·2 and 7·9·24·2 compose another refit biface. These fragments were separated by a distance of approximately 4.5 meters. Specimen 7·9·24·2 exhibits retouch along the steep broken edge which indicates one incidence of recycling after breakage.

Table 9.13 displays data on the bifaces from this occupation. The immediate manufacture category contains seven specimens, the intermediate category is composed of ten bifaces and five bifaces have been identified as biface/ discoid cores. As in the Palmer II occupation, the highest incidence of use occurs in the immediate manufacture category (100%). Evidence of use is principally identified as a semi-matte edge polish consistent with Keeley's (1980:53-55) description of meat polish. In the case of quartz, polish is not as readily formed as it is in the meta-igneous and sedimentary rocks and traces of edge nibble fractures were used as a criterion to determine use in these instances. The incidence of use in the intermediate category is considerably less than the former category. Only 60 percent of this category exhibits evidence of polish or edge nibbling in the case of quartz. Finally, only 40 percent of the biface/discoid cores exhibit polish and the intensity of the polish is low, occurring primarily on prominences. This would be consistent with the protracted staging of flake production and intermittent use of such cores for other tasks. The continuing process of flake removal would tend to decrease the chances for the persistence of wear traces and diminish their intensity. By contrast, the intensity of wear in the specimens from the immediate manufacture category is noticeably heavier which would be expected in situations where the size of tools might necessitate discard after their last use. Thus, heavy wear accumulation, again, appears to be strongly correlated with the immediate manufacture (or small) end of the biface continuum.

II. Situational Gear from the Palmer III floor consists of two basic classes: 1) flake tools and 2) amorphous cores.

Flake Tools: Flake tools can be classified in three categories: 1) unifacial retouch/wear; 2) serrated edge; and 3) bifacial marginal retouch. Table 9.14 displays selected data on the flake tools from this occupation floor. The bifacial marginal retouch category is represented by two tools. One is a large (110 x 66 x 18mm) flake blank which was cursorily shaped

Table 9.13
Data on bifaces from Palmer III occupation floor

Biface Category	Condition	Shape	Length	Width	Thickness	Height Index	Edge Polish
Immediate Manufacture							
3·9·24·1	Whole	Ovate	51	30	7	.40	X
10·7·23·1	Whole	Lanceolate	41	15	5	.67	X
1·2·24·8	Fragment				6		Quartz Nibbling
2·5·22·4	Fragment	Subrectangular			3	1.00	X
3·3·24·4	Fragment	Subrectangular			4	.33	X
13·9·23·1	Whole	Ovoid	38	24	10	.67	X
13·9·24·1	End Fragment	Ovoid			7	.40	X
Intermediate							
11·5·25·1	Whole	Lanceolate	85	36	10	1.00	X
10·8·24·2	Whole	Lanceolate/Ovate	80	38	10	1.00	X

Biface Category	Condition	Shape	Length	Width	Thickness	Height Index	Edge Polish
Intermediate (Cont'd.)							
11·3·24·3	End Fragment	Ovate	50	26	15	.67	Quartz Nibbling
1·8·24·4	End Fragment	Ovoid		45	16	.14	Quartz
10·3·24·1	End Fragment	Subrectangular			10	.25	
13·7·23·4	End Fragment	Ovoid		33	14	.56	
1·2·24·1	End Fragment	Ovoid		34	9	.50	X
12·1·25·1	Fragment	Subrectangular			10	.67	X
15·5·24·1	Fragment	Ovoid			10	1.00	X
3·8·24·5	Fragment				12	.33	
Biface/Discoid Core							
2·6·25·2	Whole	Ovate	98	58	30	.50	X
4·9·23·5 (Conjoined with 11·1·25·2)	Whole	Ovate	100	59	14	1.00	

Biface Category	Condition	Shape	Length	Width	Thickness	Height Index	Edge Polish
Biface/Discoid Core							
3·4·23·2 (Conjoined with 7·9·24·2)	Whole	Ovate	80	52	11	.38	
3·8·24·6	Tip	Ovate			12	.50	X
13·1·25·3	End Fragment	Ovate			22	.69	

Table 9.14
Data on Flake Tools for Lamella 12/11

Stratum 12/11	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex
3·7·24·2			D-D D-RL D-LL								3			W	PRIS Flake	3 ES
11·1·24·4			D-D D-RL D-LL								5	Graver Spurs (2) D/LL,D/RL		W	Flake	3 ES
3·9·25·1			D-D D-RL D-LL								3			W	PRIS Flake	3 ES
11·8·24·1			D-D D-LL								2			P,RL	PRIS Flake	3 ES
7·9·23·1			V-RL D-D D-LL								4	Graver Spur D/RL		W	PRIS Flake	3 ES
4·3·23·1			D-D D-LL D-RL								3			P	PRIS Flake	3 ES
3·7·25·8			D-D D-LL D-RL								3			W	BCRF	2 ES
2·7·22·1			D-D								1			W	FBR	3 ES
7·6·24·4			D-D D-LL D-RL								3			W	PRIS Flake	1 ES

	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex
2·1·23·2		D-RL	D-LL								2			D	PRIS Flake	3 ES
8·6·25·1			D-LL D-RL								2			D	PRIS Flake	2 ES
4·1·24·1		D-RL D-LL									2			D	PRIS Flake	3 ES
8·7·22·1				B-RL B-LL							2			D	PRIS Flake	2 ES
Joined (13·5·30·4) 13·5·25·2			V-RL	D-D			LL				3			W	DF	3 ES
11·8·24·2			D-LL								1			D	PRIS Flake	3 ES
4·8·24·4			D-D D-RL D-LL								3			W	DF	3 ES
3·2·25·6						RL					1			W	Thick FB	2
14·4·24·6			D-LL		RL						2			W	Thick FB	2
4·8·24·1			D-D								1			W	Thick FB	3
3·2·24·8				U-D-LL U-D-RL							3	Point LL/RL		W	PRIS Flake	3
3·3·25·9									RL		1			W	FBR	2
3·2·24·9				U-D-LL						RL	2			W	PRIS Flake	3

	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex
12·3·25·6							RL,LL				2			D	FBR	3
3·7·24·1							RL,LL				2			W	FBR	3
14·4·23·1						RL					1			D,P, LL	I	1
2·5·25·5				V-D-RL							1			D	FBR	3
1·1·26·2							RL,LL				2			W	FBR	3
2·1·23·1			D-LL	U-D-RL							2			W	FBR	3
8·2·25·3			D-D D-LL D-RL								3			W	FBR	3
1·6·24·2				U-V-LL							1			W	FBR	3
8·6·23·3				U-D-RL							1			W	BF	2
8·1·24·1			D-LL								1			W	BCRF	3
8·2·24·1			D-RL	U-D-LL							2			W	CR FBR	3
7·9·24·5							LL,RL				2			D	FBR	3
3·2·25·7						RL					1			W	FBR	3
3·3·25·4			D-D								1			P,RL LL	I	1
2·1·23·4							LL				2	Notch LL		P,RL D	I	3
(Joined with 3·8·24·7) 3·7·23·1			D-RL D-LL												PRIS	

	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex
6·6·24·2			V-RL V-LL								2			D	DF	3
3·6·25·2			V-RL								1			W	Thick FB	2
4·2·23·1			D-RL D-LL								2			W	PRIS Flake	3
7·3·23·2							LL				1			W	BCRF	3
4·1·25·1			V-LL								1			W	DF	2
4·3·23·3			D-RL D-LL								2			D	DF	3
14·3·24·1							RL				1			D	DF	3
12·6·25·5			D-D								1			W	BCRF	2
(Joined with 3·7·23·1) 3·8·24·7			D-D								1			P,LL RL	PRIS Flake	3
1·8·25·2				U-D-RL							1			W	DF	2
8·1·25·4							LL				1			W	DF	2
3·2·25·5						LL					1			P,RL D	I	3
3·1·24·10				V-D			RL LL				5	Notches RL,LL		W	FBR	3
7·5·23·3			D-LL D-RL								2			W	DF	3

	Scal	Dent	Uni	Ser	Bif	V-Uni Nib	D-Uni Nib	Alt Wear	Frac	Bif Nib	Tot	Tool Comb	Alt Ret	Missing	Flake	Cortex
1·6·25·4						D					1			P,LL RL	I	3
15·5·25·1					LL					RL	2			P	I	3

along the margin of one lateral edge by bifacial retouch. Retouch scars are conchoidal and average about 25mm in width. A slight polish on the apex of this edge may be present, but it is not observable macroscopically. The central edge angle for the retouch edge is 57°. The other tool is a fragment of a larger tool which was retouched bifacially along the right lateral margin and which exhibits bifacial wear along the left lateral margin. The central edge angles are 64° and 57° respectively.

A total of five serrated edge flakes were recovered from the Palmer III floor. Retouch was applied to the thin edges of the flakes and prominences are spaced at approximately lmm intervals. In all cases retouch was applied unifacially and the mean retouched edge angle is 63.2° with a standard deviation of 3.06.

The unifacial retouch/wear category is comprised of 31 specimens. These range from thick flakes with steep unifacial retouch to thin flakes exhibiting only unifacial nibbling wear. Table 9.15 displays data on the thickness of retouched/utilized edges and their associated central edge angles. On the basis of edge thickness the group can be broken down into two modes. This is illustrated in Figure 9.10. A well defined mode of thin edges occurs between 1 and 4mm. The second mode is more diffuse and ranges between 6 and 27mm. The modal distributions may indicate functional segregation, but the general unifacial character to wear and retouch across the group argues against this. A comparison of edge angle data between the two modes also suggests that they are not functionally distinct groups. A difference of means test (Student's t) was run on these two modes with the following results:

Mode I (Thin)	Mode 2 (Thick)	
$n_1 = 33$	$n_2 = 14$	$t = 0.204424$
$x_1 = 58.61°$	$x_2 = 59.24°$	$p \rangle = .10$
$s_1 = 6.56$	$s_2 = 11.24$	

The results of the t-test indicate that there is little probability that the two modes were drawn from different populations.

Table 9.15
Data on Edge Thickness and Central Edge Angle for Unifacial Flake Tools from the Palmer III occupation floor

Tool	Thickness of Edge (mm)	Central Edge Angle
12·6·25·5	14	82°
4·1·25·1	10	58°
4·3·23·3	12	55°

Table 9.15 (Cont'd.)

Tool	Thickness of Edge (mm)	Central Edge Angle
	11	50°
3·7·23·1	7	62°
	6	46°
3·8·24·7	6	76°
4·8·24·1	27	66°
3·2·24·8	6	53°
	6	62°
4·2·23·I	8	67°
	4	58°
12·3·25·6	2	57°
	3	65°
8·2·25·3	3	70°
	4	70°
	4	68°
2·1·23·1	3	62°
	3	65°
8·1·24·1	4	74°
8·1·25·4	3	68°
3· ·25·4	4	63°
8·2·24·1	2	70°
	2	68°
7·9·24·5	2	58°
	3	61°
3·1·24·10	2	68°
	2	61°
	2	65°
3·6·25·2	3	42°
14·4·23·1	3	56°
6·6·24·2	3	55°
	2	50°
7·5·23·3	15	48°
	15	65°
3·2·25·5	2	46°
	2	44°
14·3·24·1	12	40°
2·1·23·4	2	46°
1·6·25·4	2	58°
3·3·25·9	2	40°
	1	26°

Table 9.15 (Cont'd.)

Tool	Thickness of Edge (mm)	Central Edge Angle
1·1·26·2	2	45°
	1	28°
3·2·25·7	2	52°
3·7·24·1	3	63°
	2	66°
7·3·23·2	1	46°

The functional diversity of the flake tool assemblage for this occupation closely parallels that of the Palmer II assemblage, except that denticulates are absent. The percentage and frequency structures of the flake tool assemblages from the Palmer occupations are given below. The absence of denticulates may relate to functional variability between the two occupations rather than developmental or evolutionary differences.

	Denticulate		Unifacial		Serrate		Bifacial		Combination	
Palmer I			(43)	.83	(1)	.02	(7)	.13	(1)	.02
Palmer II	(6)	.10	(43)	.74	(5)	.09	(3)	.05	(1)	.02
Palmer III			(31)	.76	(5)	.12	(2)	.05	(3)	.07

The assemblage complexity of the Palmer III flake tool sample is also very similar to that of the Palmer II.

	Palmer I	Palmer II	Palmer III
1. Number of Edges used per flake	52/27 or 1.93	58/36 or 1.61	61/38 or 1.61
2. Number of different uses per flake	32/27 or 1.19	42/36 or 1.17	48/38 or 1.26
3. Number of functional categories	4	6	5

It is possible that the slight increase in the second category of complexity monitors a trend toward an increase in composite flake tools. This would include special tool combinations such as notches and points as well as combinations of the more common functional edges discussed in the preceding section.

Amorphous Cores: The final class of artifacts in the Palmer III assemblage consists of a miscellaneous group of items which appear unused but could have served as raw material sources. Their presence at the site might be explained as *de facto* garbage in the Schifferian sense (Schiffer 1975:266). Three specimens, 14·3·24·5, 3·2·25·6 and 6·6·25·1, can be described as flake blanks. They exhibit the attributes of large flakes and appear to be unaltered and/or used. Their dimensions are 75 x 50 x 30mm, 84 x 50 x 20mm and 68 x 55 x 18mm respectively and they weigh 85, 68 and 73 grams respectively. Specimen 9· ·17·1 is an unaltered water-rolled tabular rock of andesitic felsite (Raw Material B) which weighs 408 grams and is 163 x 78 x 42mm in metric dimensions. Specimen 13· ·23·2 is a spherical quartz multi-faceted core weighing 94 grams with dimensions of 49 x 45 x 36mm. Specimen 1· ·24·3 is a quartz core fragment weighing 19 grams with dimensions of 30 x 29 x 20mm.

Lamella 8 — Kirk I/St. Albans Occupation Floor

After the Palmer III occupation there is an occupational hiatus associated with lamellae 9/10 across the entire block. Cultural residue is encountered again at the lamella 8 occupation surface. By this time the lithic assemblage has undergone some dramatic changes in structure and composition and is associated with different cultural-historical phases. Two phases appear to be represented on this floor. On the basis of projectile point style, one phase can be correlated with the St. Albans phase discussed by Broyles (1966 and 1971) and more definitively by Chapman (1974, 1975 and 1977). The other phase is not well defined in the literature, but represents a bridge between the Palmer phase and the latest part of the Kirk complex which Coe (1964:70,122) associates with the Kirk serrated and stemmed projectile point types. The projectile point type associated with this occupation is a Small Corner-notched point (see Plate 11) which lacks basal bifurcation. Chapman (1975:114-118) and Broyles (1971:63,65) both identify Small Corner-notched points at Rose Island and St. Albans sites in association with their larger Kirk Corner-notched strata. Chapman states:

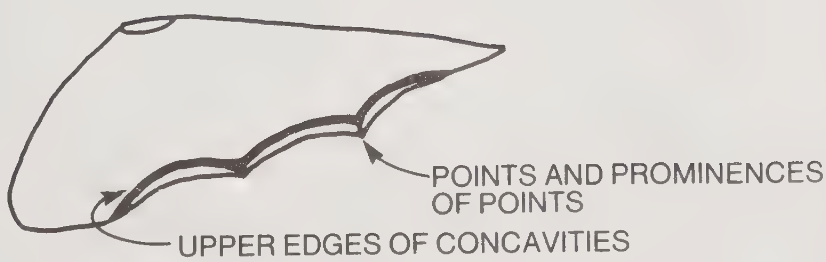
> This cluster [Kirk Corner-notched Cluster] takes its name from the Kirk Corner-notched types described by Coe (1964:69-70) and from the large and small varieties described by Broyles (1966:19,21, 1971:63,65). The points placed in this category were felt to share a majority of attributes and to differ in only a few. Stratigraphically at least one point of each of the variants was recovered from Stratum VIII in soil horizons XB21b or XB22b, effectively sealed from the bifurcated point horizons above. The radiocarbon date of 7380 B.C. ± 250 year from Feature 212 places this cluster earlier than the St. Albans phase and, within the one sigma range, the same age as Zone 20 at the St. Albans site which contained the Kirk Corner-notched, small variety type (Chapman 1975:114).

Broyles (1971:63) reports a Kirk Corner-notched, small variety type that resembles Coe's (1964) Palmer type in size, but lacks basal grinding.

A. PRESSURE APPLIED 2
TO 3MM FROM EDGE.

B. REMOVAL OF "HALF
MOON" SPALL.

C. RESULTANT SCALLOP-
EDGED TOOL.



D. OCCURENCE OF
WEAR ON SCALLOP-
EDGED FLAKE TOOLS.

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FIGURE 9.10
RETOUCH & WEAR PATTERN ON
SCALLOP-EDGED FLAKES
SMALL KIRK CORNER NOTCH

ARTIFACT PROVENIENCES – PLATE 11

ST. ALBANS PROJECTILE POINTS (STRATUM 8)

1. 3.6.18.2
2. 16.3.18.1
3. 6.4.20.5
4. 2.2.21.1
5. 16.9.17.1

SHALLOW SIDE-NOTCHED POINTS (STRATUM 8)

6. 2. .20.4
7. 6.3.20.3
8. 2.2.20.3

KIRK I PROJECTILE POINTS (STRATUM 8)

9. 1.1.20.1
10. 1.9.23.6
11. 15.3.20.2
12. 6.4.20.7
13. 1.1.23.1
14. 9.1.11.1
15. 3.4.20.7
16. 3.9.20.1
17. 6.4.20.6

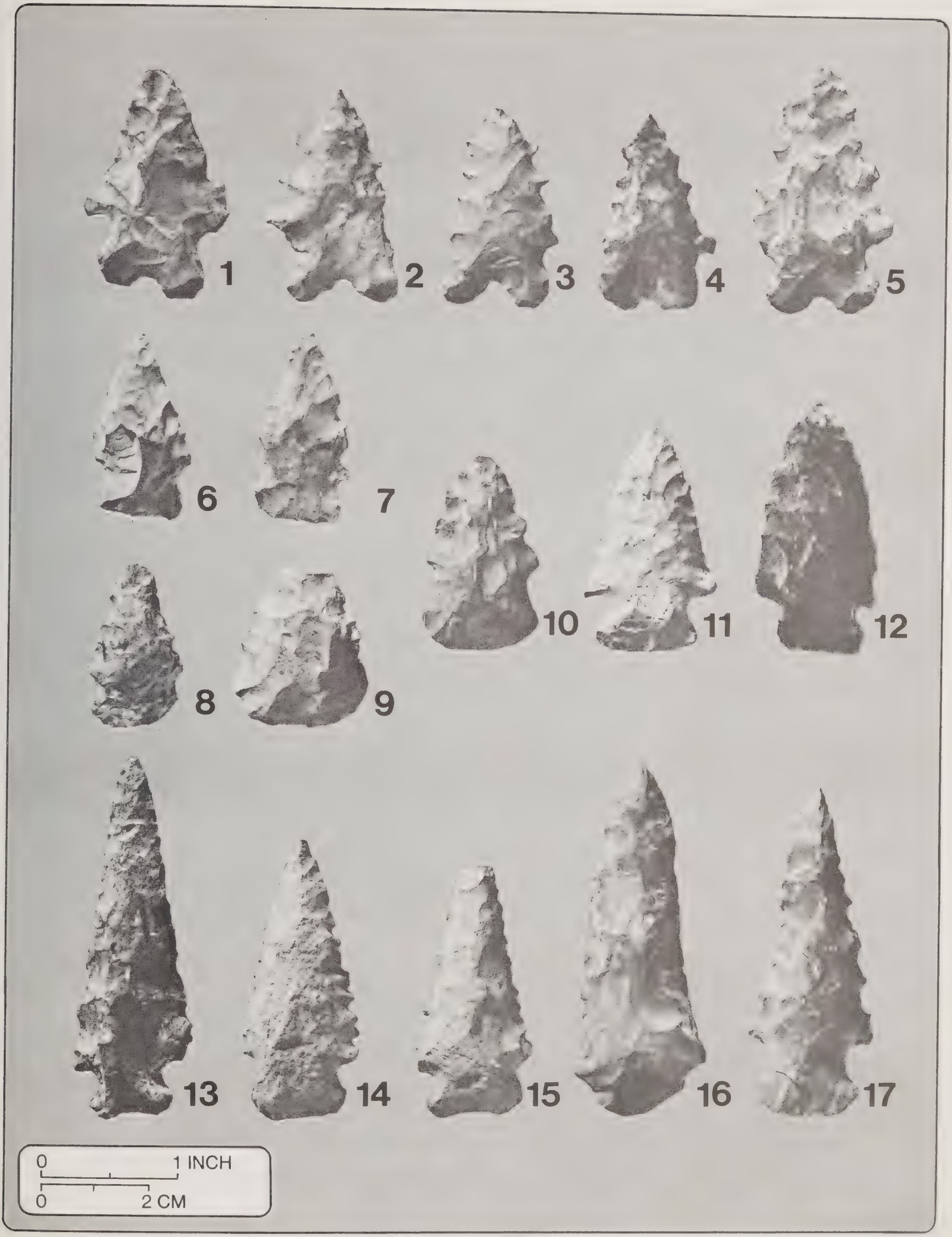

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PLATE 11
SMALL KIRK CORNER NOTCHED & ST. ALBAN SIDE NOTCHED PROJECTILE POINTS LAMELLA 8 OCCUPATION FLOOR 31CH29-BLOCK A

Although the small variety point was recognized as a stylistic variant, Chapman and Broyles could not determine its stratigraphic separation from the large variety. The Haw River excavations document a clear separation between these two projectile point forms, making feasible designation of the Small Corner-notched point as a distinct horizon marker. The Small Corner-notched point represents a different developmental response than that indicated by changes occurring in the Palmer Corner-notched points (i.e., increasing width). As such, this form should not be included in the general developmental sequence of Palmer points but should be aligned with the later Kirk serrated and stemmed points. This argument is based on three lines of reasoning. First, it can show that closely related styles persist into the subsequent occupations at the site. Second, the lamella 8 occupation floor is separated from the Palmer III floor by an occupational hiatus and is associated with decreased depositional rates (see Chapter 6), as are subsequent occupations. Finally, paleoecological data suggest that this assemblage was deposited in an environment more similar to subsequent occupations than to the preceding Palmer sequence. Therefore, it is suggested that this point be assigned the typological nomenclature of *Small Kirk Corner-notched* and that the assemblage associated with it be identified as the first subphase of the Kirk phase, or *Kirk I*.

The dual cultural-historical association of the lamella 8 floor raises some interesting questions concerning the relationship between the St. Albans and Kirk I phases. Chapman (1977:27) was able to distinguish two Kirk strata at Icehouse Bottom. The Lower Kirk stratum contained two categories of projectile points, Pseudo-Side-notched, Squared Basal Tangs (1977:49) and Deep Corner-notched, Straight to Excurvate Ground Base (1977:51). The Upper Kirk stratum contained 13 projectile point categories including Small Corner-notched, Excurvate Ground Base, Corner-notched, Small Variety and the Small Corner-notched, Excurvate Base (1977:41-44) which are similar to the Small Kirk Corner-notched points of the Haw River excavations. Chapman's sequence indicates a time-transgressive trend in projectile point width similar to the shift from large to small corner-notched points in the Haw River stratigraphy. The pooled mean of width for his categories 24 through 34 (Upper Kirk) is 22.21 mm compared to a mean width of 27.42 mm for categories 37 and 38 (Lower Kirk). The Upper Kirk stratum is directly below the Bifurcate (MacCorkle, St. Albans and Le Croy) strata at Icehouse Bottom, which argues strongly for the stratigraphic superiority of the Kirk I phase over the St. Albans phase at the Haw River sites.

Thus, if we are to rely upon Chapman's interpretations, the Kirk I and St. Albans phases at Haw River can be viewed as developmentally related, the former giving rise to the latter. This would imply that the Kirk I phase occupation residue was deposited on the lamella 8 surface first, followed by deposition of the St. Albans phase residue. An alternative interpretation is that these two phases represent roughly contemporaneous systems. The St. Albans phase could represent extension of a mountain-based adaptation centered in the Appalachians, whereas the Kirk I phase may represent a local Piedmont development.

Another interpretation would place the St. Albans and Small Kirk Corner-notched points as functional variants within a single phase or adaptive system. Chapman's stratigraphic data, however, provides a strong argument against such an interpretation. He states (Chapman 1975:269):

> The stratigraphic separation of the bifurcate points at the St. Albans site was repeated at the Rose Island site. At neither site did the data suggest that the bifurcate points were anything more than the hafting style in popular usage at the time.

Chapman's stratigraphic data supports the first interpretation, but the contemporaneous systems hypotheses are also quite feasible and deserve further attention, should the opportunity present itself for excavation of comparable Archaic strata elsewhere in the Piedmont.

I. *Personal Gear* consists of only two classes of artifacts, projectile points and bifaces. Endscrapers, although marginally present, lost the definitive form that characterized the Hardaway-Dalton and Palmer assemblages. Thus, by the Kirk I/St. Albans occupation, a trend toward the situational treatment of endscrapers, begun in Palmer II, was essentially complete. The importance of endscrapers diminished until they no longer were heavily maintained, curated tools included as personal gear.

Projectile Points from the lamella 8 occupation are divided into two major cultural-historical types, Small Kirk Corner-notched and St. Albans Side-notched. The former type will be discussed first because of its supposed antecedent relationship to the latter form.

Small Kirk Corner-notched: Projectile points placed in this typological category have stylistic affinities with four categories described by Chapman: 1) Category 27. Small Corner-notched, Excurvate Base (Chapman 1977:44-46); 2) Category 30. Corner-notched, Small Excurvate Base (Chapman 1977:46-47); 3) Kirk Stemmed Variant (Chapman 1975:120) and 4) Category 32. Small Corner-notched Excurvate Ground Base. The Kirk Stemmed Variant is considered a variant of Coe's (1964:70) Kirk Stemmed type, but judging from Chapman's photographs (Chapman 1975:119, Plate XXX) the haft element is formed by small, shallow corner-notches rather than the large, deep corner-notches which form long, thick stems in the Kirk serrated type. In addition, the blade morphologies are strikingly different. The Kirk stemmed type (Coe 1964:70) is characterized by a thick, long "dagger-like" blade with a recurvate outline. Blade thickness for Chapman's variant is considerably less, a mean of 6.2mm compared to a mean thickness of 10.00mm; blade length is also quite different, a mean of 39mm for the variant compared to a mean of 100mm for the Kirk stemmed type. Even taking into account raw material differences, the disparity in the metric dimensions appears too great to justify such a typological correlation. Additionally, the resharpening strategies differ markedly on the two forms. The Kirk stemmed type exhibits a characteristic recurvate blade outline while Chapman's variant has a broad, excurvate

blade form. Finally, the hafting element of Chapman's variant bears little resemblance to that of Broyles' (1971:66-67, Figure 7) Kirk stemmed type to which it was likened. The stratigraphic relationship of these points could not be established at the Rose Island site (only two projectile points of this variant type were recovered), but it would seem that a typological nomenclature including this variant in a small corner-notched tradition rather than the Kirk stemmed type would be more appropriate.

Chapman's categories 27, 30 and 32 are described in his report on the 1975 excavations at Icehouse Bottom (1977:44-48). Category 27 consists of forms which exhibit short triangular blades, commonly serrated blade edges, corner-notched tangs and excurvate unground bases (see Chapman 1977:45, Figure 20a). Category 32 is distinguished from 27 essentially by the presence of basal grinding (1977:45, Figure 20b, 47). Category 30 also exhibits small triangular blades, commonly serrated blade edges and excurvate bases (Chapman 1977: 45, Figure 20a). However, it is noted that the corner-notching is broad "creating the effect of expanded stems" in some specimens (Chapman 1977:46). Slight basal grinding occurs in some cases.

The general picture which emerges from this discussion is that change in projectile point design between late Palmer (i.e., Palmer II and III occupations, this report) and the small corner-notched varieties was marked by the following characteristics:

1) Increased blade resharpening resulting in marked axial shortening of blades and narrowing of shoulders.

2) Decreased occurrence of basal grinding, some individual points exhibiting only slight grinding and others exhibiting no grinding.

3) Corner-notches become broader and, in combination with increased resharpening, give the appearance of stems or wide shallow side-notches.

4) Bases change from straight to excurvate outlines.

Without clear stratigraphic separation, however, it is impossible to determine whether Chapman's categories represent temporally sensitive styles or whether the Kirk I phase was characterized by a good deal of design variability. In the case of categories 27 and 32, the only difference apparent from Chapman's plate (1977:Figure 20a, b) is basal grinding. This may be an exclusive trait with temporal significance or, on the other hand, it may represent a trait which occurs with varying frequency but is not exclusive to a particular temporal range. The previous discussions of change in basal grinding on Palmer points would suggest that the latter relationship more accurately reflects the character of change in this trait. Differences between these categories and category 30 may reflect alterations made in repairing the haft and/or resharpening the blade, rather than design differences. Thus, even

Table 9.16 Attributes of Small Kirk Corner-Notched Projectile Points

	Blade Outline	Serration	Base Outline	Basal Grinding	Haft Element Juncture	Haft Element Geometry: Distal Point of Juncture	Haft Element Geometry: Medial Points of Juncture	Haft Element Geometry: Proximal Points of Juncture	Tip Angle
1·9·23·6	Straight	Present	Straight	Slight	Lateral-Lateral	Obtuse-Angular	Obtuse	Obtuse-Circular	55°
1·1·20·1	Straight	Present	Sub-Convex	Slight	Lateral-Lateral	Obtuse-Angular	Obtuse	Obtuse-Circular	46°
10·7·20·7			Sub-Convex	Absent	Lateral-Lateral		Obtuse	Obtuse-Circular	
6·4·20·6	Incurvate	Present	Straight	Heavy	Lateral-Base Defining	Obtuse-Angular	Obtuse-Right Angled	Obtuse-Circular	33°
11·7·8/10·2	Irregular	Absent	Sub-Convex	Slight	Lateral-Base Defining	Obtuse-Angular	Obtuse	Obtuse-Angular	30°
15·3·20·2	Recurvate	Absent	Sub-Convex	Slight	Lateral-Base Defining Lateral-Coincidental	Right-Angled-Angular Acute-Angular	Right-Angled Acute	Acute-Circular	51°
9·1·11·1	Straight	Present	Straight	Absent	Lateral-Base Defining	Obtuse-Angular	Obtuse Acute	Obtuse-Circular	38°

					Haft Element Geometry				
	Blade Outline	Serration	Base Outline	Basal Grinding	Haft Element Juncture	Distal Point of Juncture	Medial Points of Juncture	Proximal Points of Juncture	Tip Angle
3·4·20·7	Straight	Present	Sub-Concave (Broken)	Absent	Lateral-Base Defining Lateral-Coincidental	Obtuse-Angular	Obtuse Acute	Obtuse-Circular	25°
6·4·20·7	Excurvate	Absent	Straight	Absent	Lateral-Basal Lateral-Base Defining	Right-Angled-Circular Acute-Angular	Obtuse Acute	Right-Angled Circular Obtuse-Circular	48°
1·1·23·1	Straight	Absent	Sub-Concave	Slight	Lateral-Base Defining	Right-Angled Angular Acute-Angular	Acute	Obtuse-Circular	23°
6·5·19·1	Straight	Absent	Sub-Concave	Slight	Lateral-Lateral	Obtuse-Angular	Obtuse	Obtuse-Circular	29°
12·7·20·1	Irregular	Absent	Straight	Absent	Lateral-Lateral	Obtuse-Circular	Obtuse	Acute-Angular	Distal Rounding 62°
3·9·20·1	Recurvate	Absent				Obtuse-Angular			63°

	Blade Outline	Serration	Base Outline	Basal Grinding	Haft Element Juncture	Haft Element Geometry: Distal Point of Juncture	Haft Element Geometry: Medial Points of Juncture	Haft Element Geometry: Proximal Points of Juncture	Tip Angle
3·1·19·1			Straight	Absent			Obtuse	Obtuse-Circular Right-Angled Circular	
12·1·19·2			Sub-Concave	Absent			Obtuse	Right-Angled Circular	

though certain artifacts from the Haw River Small Kirk Corner-notched (see Plate 12) sample may be closer to one of Chapman's categories than to the others, it is not appropriate to make these typological distinctions at present.

Table 9.16 displays data concerning haft geometry and aspects of blade and base morphology for the Small Kirk Corner-notched sample recovered from 31Ch29. Variability in blade morphology (outline and serration) appears to relate to a life-history sequence. A relative measure of life-history was obtained from the measurement of tip angle (see Appendix 2 for an explanation of this measurement). Because the major resharpening strategy exhibited on these points involved the conservation of blade length at the expense of width, it follows that tip angle should decrease with the extended use-life of individual projectile points. As would be anticipated (see Table 9.17) excurvate and recurvate blades associate with high tip angles and straight to incurvate blades associated with low tip angles. Straight outlines could conceivably associate with higher tip angles if resharpening strategies emphasize axial shortening of blades. Two exceptions to the rule are found in the straight blade outline column where obviously late stage points (1·9·23·6 and 1·1·20·1) also have high tip angles. In these instances blade length has been significantly shortened during the life-history of the tools resulting in inflated tip angles.These examples represent extremely late resharpening strategies.

Table 9.17
Relationship of Blade Outline to Tip Angle

Blade Outline	Excurvate	Recurvate	Straight	Straight Serrated	Incurvate	Incurvate Serrated	Irregular
Tip Angle							
21°-25°			1	1			
26°-30°			1				1
31°-35°				1		1	
36°-40°				1			
41°-45°							
46°-50°	1			1			
> 50°		2		1			1

It is possible to reconstruct blade life-history stages from this information. Figure 9.11 illustrates an idealized model of these stages. Serration, as indicated, occurs relatively late in this sequence, with narrow incurvate and straight blade outlines. Serration also occurs on the straight, axially shortened blades.

Comparison of these data with projectile points from the three Palmer occupations produces similar conclusions about serration (refer to Table 9.18)

Table 9.18
Relationship Between Serration and Life History Stage
(measured by tip angle)
for the Palmer I, II and III projectile point samples.

Tip Angle	Excurvate	Excurvate Serrated	Straight	Straight Serrated	Incurvate	Incurvate Serrated	
Late < 50°			1	3			Palmer I
Early > 50°	2	1					
Late < 50°		1		1		1	Palmer II
Early > 50°	1		2			1	
Late < 50°		1	1				Palmer III
Early > 50°	4	1					

Such data would suggest that serration may not signify a distinctive functional specialization, but an indication of later stage resharpening strategies, since serration may enhance the cutting qualities of blades that otherwise might experience a decreased cutting efficiency with increased use-life.

Haft elements (see Table 9.19) exhibit variability which also can also be interpreted from the perspective of life-history. The fairly clear stages of resharpening on blades, however, are not paralleled in the life-history of the haft element. This is principally because the morphological variability in the haft element results from episodes of breakage and repair. Such processes are random in their occurrence and can happen at any stage in the life history of a tool. In such circumstances great diversity in individual shapes and structures of tangs should not be unexpected (Figure 9.11).

Examination of the information on haft element geometry in Table 9.19 provides a basis for reconstructing the modal form for the Haw River Small Kirk Corner-notched sample (refer to Appendix 2 for a definition of pertinent terms). Initially, the juncture appears to have approximated a lateral-base defining form. The distal point of juncture was probably acute-angular, the medial points of juncture appear to have been most commonly acute and the proximal points of juncture were obtuse-circular. The basal outline probably began as straight to sub-convex in form. Figure 9.10a shows an idealized early stage projectile point (Chapman's category 30).

During the use-life of the tool a number of factors transform the original outlines of elements. Figure 9.10b (Chapman's category 27 or 32) represents an axially-shortened example where blade resharpening has changed the haft element juncture from a lateral-base defining form into a lateral-lateral or side-notched form. The distal and medial junctures have also been transformed by blade resharpening. Figure 9.10c (Chapman's Kirk Stemmed

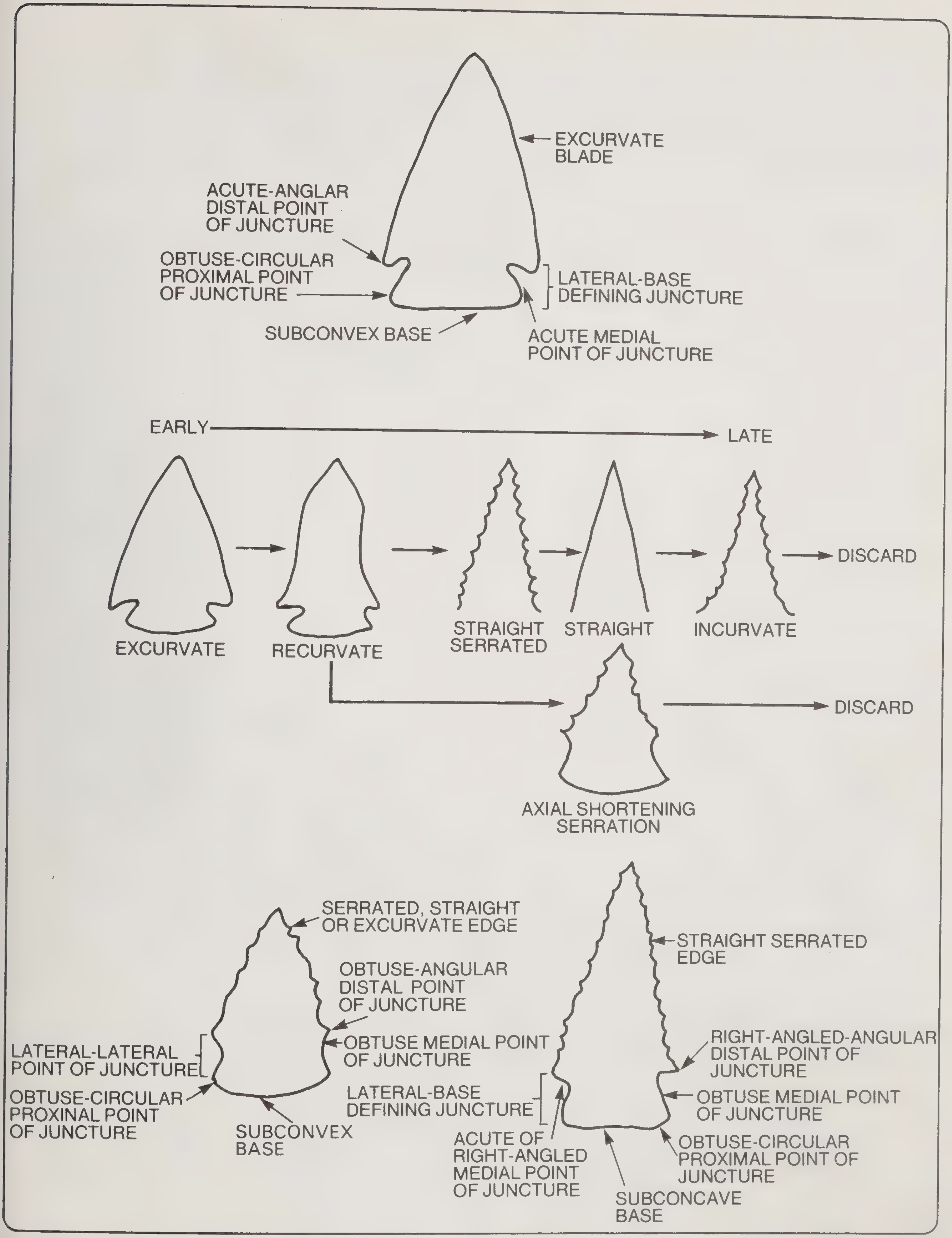

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FIGURE 9.11
LIFE-HISTORY STAGES OF
BLADE & HAFT ELEMENTS

Variant) illustrates another life-history trajectory where the distal and medial points of juncture are transformed, but the lateral-base defining juncture remains similar to the idealized example. The base has been transformed into a subconcave outline due to breakage or repair. In the Haw River sample subconcave bases are associated with late stage points possessing tip angles of 23°, 29° and 25° (see Table 9.19).

Measures of central tendency for the metric attributes of the Haw River Small Kirk Corner-notched projectile points are presented in Table 9.19.

Table 9.19
Summary statistics for metric data,
Small Kirk Corner-notched projectile points

Metric Attributes	n	$\overline{x}$	s
Thickness	13	7.77mm	1.42mm
Base Width	13	19.15mm	3.06mm
Tang Width	15	15.80mm	2.61mm
Shoulder Width	12	21.92mm	2.56mm
Blade Width 2	12	15.25mm	2.20mm
Axial Length	9	51.00mm	9.51mm
Tang Length	13	11.92	2.91mm
Blade Length	8	40.63mm	11.42mm
Notch Length	12	7.75mm	2.71mm
Combined Edge Angle	74	59.44°	21.16°

Comparison of these data with summary statistics for the three Palmer Corner-notched samples (refer to Table 9.10) indicates that the pattern of directional change in Palmer phase projectile points is nearly reversed in the sample of points from the Kirk I occupation. Base, tang and shoulder width decrease sharply from the extremely high values exhibited in the Palmer III sample, actually dipping below the mean width dimensions for the Palmer I sample. Thickness, blade length and tang length, by contrast, continue along a very slowly increasing trajectory. The results of t-tests comparing selected dimensions of the Small Kirk Corner-notched, Palmer occupation I and Palmer occupation III samples.

Metric	Occupation I		Occupation III	
Dimensions	t-value	Probability	t-value	Probability
Base Width	1.125	$P > .10$		
Tang Width	0.766	$P > .10$		
Shoulder Width	1.818	$.05 > P > .025$		
Tang Length	2.600	$P < .01$	0.944	$P > .10$
Blade Length	4.503	$P < .0005$	0.999	$P > .10$

These results indicate that the width dimensions of Small Kirk Corner-notched points are indeed very similar to the point sample from the Palmer I occupation. In fact, there is no statistical difference between the samples for base and tang width. Shoulder width, on the other hand, is significantly smaller in the Small Kirk Corner-notched sample. These changes in the width dimensions of projectile points represent an abrupt break in the directional changes detected for the Palmer Corner-notched trajectory and constitute a return to width dimensions very much like those of the earliest Palmer points. However, this similarity breaks down when length dimensions are considered. Blade and tang lengths are significantly larger in the Small Kirk Corner-notched sample. These dimensions are slightly higher than those of the Palmer III sample, but they are not statistically significant.Thus, it appears that Small Kirk Corner-notched projectile points exhibit an abrupt change in width dimensions from the Palmer III sample, but continue the trends of gradual increases in length and thickness dimensions established through the span of the Palmer phase.

Basal grinding is present on only 50 percent (n = 7) of the sample and in only one case was the intensity of grinding high. This pattern also continues the earlier Palmer trend.

St. Albans Side-notched: The St. Albans Side-notched projectile point has been described by Broyles (1966:23,25, 1971:73,75) and Chapman (1975:108-110, 1977: 39-40). Broyles (1971:73,75) places the relative chronological position of St. Albans Side-notched (Variety A and B) between Kirk Corner-notched and the later LeCroy Bifurcated Base. Chapman's (1975:269, 1977:39-54) stratigraphic data from Rose Island and Icehouse Bottom adds strong support to Broyles' original interpretation of the St. Albans Side-notched as a derivative of the (Kirk) Corner-notched tradition.

Broyles (1971:72-75) distinguished two varieties (A and B) of St. Albans Side-notched, the distinguishing feature being the absence of shoulders in Variety B. Variety A is described in the following manner (Broyles 1971:73):

> Blades are triangular with straight or excurvate sides thinned by large flakes, secondary chipping occurring rarely. Sides are serrated on most of the specimens. Tips are sharp and sometimes off-center, probably a result of being reworked from a slightly larger point. Bases are deeply notched and smoothed from shoulder to shoulder. Shoulders are well defined; some are straight, but most slope toward the tip.

Chapman (1977:39) describes the examples from Icehouse Bottom in the following manner:

> Form: Small triangular blades with serrated edges on ten specimens. Two blades are reworked and one of these has one edge burinated. Although the type is described as side-notched, most of the points appear to have been

corner-notched. The base is notched which creates expanding ears at the base. It is the degree to which the shoulders have been reduced that creates the impression of side-notching. Grinding occurs on the stem edges on eight specimens and in the basal notch on eleven specimens. Cross section: flattened and biconvex.

A total of nine diagnostic St. Albans Side-notched projectile points were recovered from excavations at 31Ch29 (see Plate 11). Two of these projectile points, 13·8·25·1 and 2·6·28·1, were displaced downward by disturbance and consequently were found in the lower Palmer occupations. Specimen 6·8·18·14 corresponds to Broyles' (1971:74) Variety B. The entire surface exhibits a polished luster probably the result of water rolling. One side of the blade has been unifacially rechipped to expose a fresh surface. It is not included in the metric comparisons below.

Dimensional statistics for this sample are presented in Table 9.20. Notable differences between this sample and the previously discussed Small Kirk Corner-notched sample occur in thickness, blade and tang length, notch length and combined edge angle. If these two point types are indeed developmentally related as Chapman contends, then several patterns of change emerge. First, thickness decreases significantly in the St. Albans Side-notched sample, actually approximating or dipping below the Palmer I sample. A t-test run against the Small Kirk Corner-notched sample (see Table 9.20) indicates that there is little probability that the two samples (Small Kirk Corner-notched and St. Albans Side-notched) were derived from the same population. Blade length also appears to decrease significantly at the .025 level. This change may result from an increased emphasis on axial shortening as a blade resharpening technique. The mean edge angle at time of discard decreases dramatically from 59.44° to 49.86°. In both blade length dimensions and combined edge angle the St. Albans Side-notch sample again approximates the Palmer I sample, t-test results comparing the Palmer I and St. Albans samples indicate that there is no statistical difference in mean combined edge angle ($t = 0.29$, $P > .10$) and there is little, if any, difference in blade length ($t = 1.41$, $.10 > P > .05$). All of the other dimensions remain comparatively unchanged from the Small Kirk Corner-notched sample. Tang length appears to exhibit the most notable change, again continuing a gradual trend of increase begun in the Palmer sequence.

Table 9.20
Summary statistics for St. Albans Side-Notched sample and t-test comparisons between St. Albans and the Small Kirk Corner-Notched sample

				St. Albans vs. Small Kirk Corner-notched	
Metric Attributes	n	$\bar{x}$	s	t-value	Probability
Thickness	8	6.00mm	0.50mm	3.92	$P < .0005$
Base Width	7	20.00mm	1.20mm	0.84	$P > .10$

Table 9.20 (Cont'd.)

Metric Attributes	n	$\overline{x}$	s	St. Albans vs. Small Kirk Corner-notched t-value	Probability
Tang Width	7	16.14mm	0.64mm	0.46	P 〉.10
Shoulder Width	7	22.14mm	3.38mm	0.14	P 〉.10
Blade Width 2	7	14.71mm	2.01mm	0.50	P 〉.10
Axial Length	7	41.29mm	6.11mm		
Tang Length	7	13.00mm	1.60mm	1.01	P 〉.10
Blade Length	7	28.29mm	5.73mm	2.51	.025 〉P 〉.01
Notch Length	8	10.00mm	3.04mm	1.64	.10 〉P 〉.05
Combined Edge Angle	42	49.86°	13.06°	2.99	.005 〉P 〉.0005

By the St. Albans phase the reversion, begun in Kirk I, back to the dimensional structure of the Palmer I projectile point sample is nearly complete. Table 9.21 demonstrates the similarities between the dimensions of these two samples. The similarities are extensive with the major difference occurring in the blade to tang length ratio. This increase in tang length foreshadows a subsequent trend which culminates in large stemmed projectile points.

Table 9.21
Comparison of dimensional similarities between Palmer Corner-notched (Occupation I) and St. Albans Side-notched Projectile Points

Metric Attributes	St. Albans Side-notched $\overline{x}$ (mm)	s (mm)	Palmer Corner-notched (I) $\overline{x}$ (mm)	s (mm)
Thickness	6.00	0.50	6.14	0.64
Base Width	20.00	1.20	21.17	4.06
Tang Width	16.14	0.64	16.17	2.73
Shoulder Width	22.14	3.38	23.43	3.02
Blade Width 2	14.71	2.01	16.14	
Axial Length	41.29	6.11	42.50	
Tang Length	13.00	1.60	9.83	1.21
Blade Length	28.29	5.73	33.14	6.13
Notch Length	10.00	3.04	8.16	
Combined Edge Angle	49.86°	13.06°	50.57°	9.17°

Grinding occurs on all observable (n = 7) bases and is quite heavy in five cases. Slight to moderate grinding also occurs between the medial points of juncture of the haft element and along the edge formed by the proximal medial points and the proximal points of juncture. There is also grinding on all observable (n = 7) basal notches. This might also represent a technological reversal, but is should be noted that much of what is currently identified

as basal grinding may in fact be due to wear abrasion in the haft rather than intentional dulling. Serration occurs on all eight specimens and all appear to represent late stage blade reduction. The mean tip angle for the sample is 40.42° with a range of 50° to 24°.

Three specimens of a form which appears to be a transition between the two major point types were recovered from lamella 8 occupation floor (see Plate 11). Chapman (1975:123 and Plate XXX) identified four similar specimens from the Rose Island site which he referred to as Shallow Side-notched. These projectile points exhibited straight bases and occasional basal grinding and were recovered from the St. Albans horizons at the site. The three examples recovered in the excavations at 31Ch29 exhibit short triangular blades, shallow side-notches (approximating a square stem in one extreme case, 2· ·20·4), and straight, unground bases. Remnant serrations occur on two of the specimens.

Summary statistics on the metric attributes of these Shallow Side-notched points are presented in Table 9.22.

Table 9.22
Summary statistics for Shallow Side-notched projectile points from the Lamella 8 occupation floor

Metric Attributes	n	$\overline{x}$ (mm)	s
Thickness	3	6.67	1.25
Base Width	3	15.67	0.47
Tang Width	3	14.00	0.00
Shoulder Width	3	17.67	0.94
Blade Width 2	3	13.33	1.25
Axial Length	3	33.00	2.16
Tang Length	3	10.33	0.47
Blade Length	3	22.67	2.05
Notch Length	3	9.00	1.41
Combined Edge Angle	18	61.95°	11.91°

The relationship between the Shallow Side-notched projectile point and the two major projectile point styles from this occupation is unclear. They exhibit tendencies toward decreased thickness and increased emphasis on axial shortening as a resharpening technique like the St. Albans Side-notched. On the other hand, the combined mean edge angle and the presence of straight bases recalls the Small Kirk Corner-notched. Therefore, the Shallow Side-notched may represent a transitional form or it may simply represent a functional variant of one of the two major types.

Besides the projectile point groups discussed above, three point tips were also recovered from this occupation floor.

Bifaces: Bifaces from the lamella 8 occupation consist of 27 whole and 32 fragmental specimens representing 57 individual bifaces (see Plate 14). The biface/discoid core category contains 10 pieces representing 10 individual bifaces. This group was clearly differentiated from the remaining bifaces on the basis of size (see Table 9.23). The remaining 49 pieces, (representing 47 individual bifaces) however, could not be distinctly divided into intermediate and immediate manufacture categories. Therefore, these two categories are combined in this analysis (refer to Table 9.23). Of the whole bifaces in this latter category, 13 out of 20 exhibit evidence of striking platforms, indicating bifacial core reduction. The predominant flake type for these blanks corresponds to the side-struck flake of bifacial core reduction (see Table 9.23).

Both categories contain a high incidence of utilization with the biface/discoid core category exhibiting 80 percent utilization and the intermediate/immediate manufacture category showing an 84 percent utilization. Utilization was measured in terms of edge polish which was quite variable in intensity and continuity. In many cases polish occurs only on prominences remaining after resharpening episodes. However, the pattern of wear is strikingly similar over the entire assemblage. It consists of a semi-matte polish distributed generally over the entire perimeter of the edges. The luster of the polish is consistent with Keeley's (1980:53) description of meat polish. A fainter, duller facial polish is also ubiquitous, primarily occurring on ridge prominences. Although, as discussed previously, this "polish" phenomen may actually indicate the initial stages of patination (see Keeley 1980: 29), it is worth mentioning that it is only occasionally noted on flake tools which, presumably, should be subject to the same rate of patination as bifaces from the same floor. Given these considerations, it is likely that the lamella 8 bifaces were predominantly used as butchering implements as discussed by Keeley (1980:53-54).

Many of these bifaces exhibit characteristics of possible axing uses (see Plate 14) such as ovate distal edge outlines and subrectangular to rectangular proximal edge outlines (refer to the shape column in Table 9.23), distal outlines are listed first and are separated from proximal outlines by a slash). The proximal edges are sharp with a mean edge angle of 53.29° and represent a fairly tight range of individual values with a standard deviation of only 8.19°. They exhibit evidence of both resharpening and impact fracturing (which carries, on average, about 5mm invasively). On prominences along this edge there is, in every case, remnant evidence of polish. A total of 17 of the bifaces correspond to these characteristics and are indicated by an asterisk in the shape column of Table 9.23. It is possible that the ovate edge specimens were used in similar activities, but in many cases the ovate proximal edges contain unchipped striking platforms which would be prohibitive to axing. The characteristic biface wear patterns, which are consistent through all of the occupations of the site, merit further consideration under controlled experimental conditions.

II. Situational Gear consists of two classes of artifacts: 1) Flake Tools and 2) Miscellaneous cores.

Table 9.23 Data on Bifaces from Lamella 8 Occupation Floor

Biface Category	Condition	Shape	Width (mm)	Length (mm)	Thickness (mm)	Height Index	Edge Polish	Weight (gms)
Biface/Discoid Core								
1·2·21·1	Whole	Ovate/Ovate	75	149	42	0.56	X	508
9·8·10·5	Whole	Ovate/ Subrectangular[1]	51	119	24	0.71	X	162
5·8·21·2	Whole	Ovate/ Subrectangular[1]	48	89	20	0.54	X	108
3·2·19·3	Whole	Ovate/ Subrectangular*	46	87	22	0.83	X	108
6·3·20·1	Whole	Discoidal	58	65	23	0.64		81
5·2·21·9	Whole	Ovate/Ovate	55	77	18	0.80	X	79
3·9·18·1	Whole	Ovate/Ovate	33	84	22	0.29	X	59
6·3·20·4	Fragment	Ovate			18			
5·6·21·8	Whole	Ovate/ Subrectangular[1]	43	86	18	0.50	X	63

Biface Category	Condition	Shape	Width (mm)	Length (mm)	Thickness (mm)	Height Index	Edge Polish	Weight (gms)
16·7·21·1	Whole	Ovate/ Subrectangular[1]	47	93	19	0.90	X	71
$\overline{x}$			50.67	94.33	22.60	0.64	80%	137.67[1]

[1]Mean weight without specimen 1·2·21·1 is 91.38 gm.

Intermediate/ Immediate Manufacture	Condition	Shape	Width (mm)	Length (mm)	Thickness (mm)	Height Index	Edge Polish	Weight (gms)	Flake Blank Type
1·8·21·11	Fragment	Ovate			14				
1·2·23·9	Fragment	Ovate			11	0.45	X		
1·2·21·4	Whole	Ovate	35	86	18	0.20	X	43	SSBCR
1·1·23·2	Whole	Ovate/ Subrectangular[1]	24	62	12	0.71		16	SSBCR
1·7·22·6	End	Ovate	49		16	1.00			DCF
1·1·20·1	End	/Ovate	23		17	0.89	Quartz		
1·2·20·3	End	/Ovate	28		11	0.83	Quartz		

Intermediate/ Immediate Manufacture	Condition	Shape	Width (mm)	Length (mm)	Thickness (mm)	Height Index	Edge Polish	Weight (gms)	Flake Blank Type
1·7·20·9	End	Subrectangular[1]	20		8	1.00	X		
1·7·21·10	End	Ovate	35		14	1.00			
2·1·20·2	End	Ovate	36		8	0.60	X		
2·4·20·5	Whole	Ovate/Ovate	28	67	13	0.63	X	11	SSBCR
2·5·20·6	End	Ovate	27		9	0.80	X		
2·1·20·1	Lateral	Ovate			10	0.88			
2·7·21·3	Whole	Ovate/ Subrectangular[1]	32	61	10	0.67	X	16	
3·3·20·5	Whole	Ovate/Ovate	31	47	9	0.80	X	14	SSBCR
3·7·20·6	Whole	Ovate/Ovate	32	56	10	0.67	X	16	SSBCR
3·5·20·2	Lateral	Ovate		11	0.57	X			
3·2·19·4	End	Rectangular[1]	47		10	1.00	X		
3·1·20·10	End	Ovate/			6	1.00	X		
3·5·18·4	End	Ovate/			4	0.33	X		

Intermediate/ Immediate Manufacture	Condition	Shape	Width (mm)	Length (mm)	Thickness (mm)	Height Index	Edge Polish	Weight (gms)	Flake Blank Type
3· ·19·9	End	Ovate/					Quartz		
3·4·20·9	End	Ovate/			8	1.00			
3·1·19·6	Fragment	Irregular			11	0.57			
(Conjoined 3· ·20·4) 3·1·21·1	Conjoined Whole	Ovate/ Subrectangular[1]	32	78	9	0.80	X	22	
3·1·19·2	Whole	Ovate/Ovate	40	68	12	0.71	X	37	SSBCR
4·3·19·1	Whole	Ovate/ Subrectangular[1]	25	119	8	1.00	X	23	
5·3·21·11	End	Ovate			8	0.33	X		
5·5·21·7	Lateral	Ovate			10	1.00	X		
5·7·22·1	Whole	Ovate/ Subrectangular[1]	31	51	8	0.60	X	10	FBR
6·6·22·1	End	Ovate			10	0.67	X		

Intermediate/ Immediate Manufacture	Condition	Shape	Width (mm)	Length (mm)	Thickness (mm)	Height Index	Edge Polish	Weight (gms)	Flake Blank Type
6·8·21·5	Lateral	Ovate			6	0.20	X		
6·1·20·2	Whole	Ovate/Ovate	39	88	12	0.33	X	50	SSBCR
6·8·20·8	Whole	Ovate/Ovate	23	47	9	0.80	X	8	
6·2·19·1	Whole	Ovate/ Subrectangular[1]	38	63	8	1.00	X	18	SSBCR
7·1·18·2	Whole	Ovate/Ovate	32	71	9	0.80	X	22	SSBCR
7·7·20·3	Whole	Ovate/Ovate	31	42	9	0.50	X	12	CRFBR
8·8·18·1	End	Subrectangular[1]	45		10	1.00	X		
8·9·19·1	End	Ovate			9	0.50	X		
8·5·17·4	End	Subrectangular[1]	32		8	1.00	X		
10·3·22·1	Whole	Ovate/ Subrectangular[1]	40	52	7	0.75	X	13	SSBCR
10·3·20·2	Lateral	Ovate/Ovate		61	9	0.50	X		

Intermediate/ Immediate Manufacture	Condition	Shape	Width (mm)	Length (mm)	Thickness (mm)	Height Index	Edge Polish	Weight (gms)	Flake Blank Type
10·1·20·1	Whole	Ovate/Ovate	33	93	8	1.00	X	31	
12·2·21·1	End	Ovate			5	0.25	X		
13· ·19·1	Whole	Subrectangular[1]	27	48	10	0.43	X	17	
13· ·20·2	Whole	Ovate/Ovate	29	49	8	0.60	X	12	SSBCR
15·7·21·1	Whole	Ovate/ Subrectangular[1]	39	66	13	0.86	X	30	
$\bar{x}$			32.77	65.48	9.89	0.71	84%	21.05	

Flake Tools from the lamella 8 occupation consist of seven categories: 1) Endscrapers; 2) Adzes; 3) Scalloped-edge tools; 4) Denticulates; 5) Serrated-edge tools; 6) Unifacially retouched or worn tools and 7) Bifacial, marginally retouched tools (see Table 9.23).

1) Endscrapers as mentioned previously, undergo a dramatic reorganization between the Palmer III and the lamella 8 occupations. The special characteristics of shaping and design which typified the endscrapers of earlier occupations are no longer in operation, and the endscraper is fully incorporated into the organizational matrix of situational gear. Only two specimens, 8·8·19·1 and 12·6·19·1, could be distinguished as endscrapers from the flake tool assemblage (see Plate 16 and Table 9.24). Specimen 8·8·19·1 was manufactured from a large, thick secondary flake (78mm x 41mm x 26mm) whose dimensions are completely beyond the general endscraper categories of previous occupations. It would most closely correspond to Coe's (1964:76) Type III endscraper:

> They averaged about 70 mm in length, 45mm in width, and 15mm in thickness. They were roughly chipped along the edges into an oval shape and worked across the broad end. Unlike the Type I endscrapers, though, these working edges were never worn smooth. They remained irregular and sharp.

Coe (1964:76) comments that this endscraper type was typical of the Stanly and Morrow Mountain assemblages at the Doershuck site. The specimen from the lamella 8 occupation was shaped along the lateral and distal edges. The distal edge constitutes the working edge. It is characterized by heavy step fracturing extending, at maximum, up the dorsal face approximately 4mm. A slight edge polish occurs along the perimeter of the irregular edge. Slight edge polish also occurs along the lateral edge margins.

Specimen 12·6·19·1 (see Plate 16 and Table 9.24) is of a completely different form. It was manufactured from a thin, central-ridged biface thinning flake. Its measurements are: 60mm x 33mm x 7mm. The proximal edge exhibits a bifacially faceted platform derived from a biface core. A heavy polish accompanies the faceted platform which is indicative of previous biface use. The endscraper, although quite expedient in its manufacture, represents a complex tool. The right lateral margin exhibits a bifacially retouched, serrated edge bearing a meat polish (see Keeley 1980:53-54) along the medial aspect of the edge. Between the right lateral and distal edges a graver spur was formed by the application of unifacial retouch. The distal edge is unretouched, but exhibits unifacial fracturing along the dorsal face and a very slight polish along the medial aspect of the edge indicative of hide scraping wear (see Keeley 1980:51-53). The left lateral margin is unretouched, but exhibits edge crushing, unifacial, dorsal nibbling and polish along the edge and dorsal prominences indicative of cutting uses. Edge angles are 58°, 45° and 45°, 51°, 48°, and 52°, and 25°, 30° and 37° respectively for the right lateral, distal and left lateral edges.

Table 9.24 Flake Tools, Lamella 8 Occupation

Stratum 8	Scalloped	Denticulate	Other Unifacial Conchoidal	Bifacial Serrated	Other Bifacial	Ventral Unificial Nibbling	Dorsal Unifacial Nibbling	Alternate Nibbling Same Face	Edge Fracture	Bifacial Nibbling	Total No. Utilized/Retouched Edges	Projections	Alternate Unifacial Facial Retouch Same Edge	Missing Edges	Flake Type
1·7·20·10			D-RL	U-V-LL		LL	RL				2			P	CR FBR
1·2·20·4 ,	LL					RL					2			W	FBR
1·3·20·5				U-RL			D-LL				2			P	CR FBR
1·4·20·6							RL, LL				2			D	FBR
1·2·21·2							LL				1			W	CR FBR
1·5·22·4							RL, LL				2			D, P	CR FBR
1·1·23·7															DF
1·2·23·3				RL			LL				2			D	DF
2·6·20·8					D, LL		RL				3		RL	W	SSBCR
2·8·19·5				U, LL							1			W	SSBCR
2·5·19·3		V-LL	D-RL			LL	RL				2			W	Thick FB
2·1·20·9						LL	LL				1		LL	W	BCRF
2·7·21·4							RL, LL, P				5	G-LL/D G-RL/D		W	FBR
3·4·18·14						RL	D, LL				3			W	CR FBR

Stratum 8	Scalloped	Denticulate	Other Unifacial Conchoidal	Bifacial Serrated	Other Bifacial	Ventral Unificial Nibbling	Dorsal Unifacial Nibbing	Alternate Nibbling Same Face	Edge Fracture	Bifacial Nibbling	Total No. Utilized/Retouched Edges	Projections	Alternate Unifacial Facial Retouch Same Edge	Missing Edges	Flake Type
3·4·18·5	D-RL D-LL										2			D	CR FBR
3·1·18·9							D				1			W	CR FBR
3·6·18·1			D-RL				RL				i			D	SSBCR
3·2·19·10							RL, LL				2			D	FBR
3·3·19·5							RL				1			W	DF
3·8·19·14						RL, LL	LL		LL		2	LL		W	FBR
4·4·21·2							LL				1			D, P, RL	I
4·8·21·1			V-LL			RL					2			W	DF
5·3·20·6						RL					1			W	CR FBR
5·3·21·12							RL, LL				2			W	FBR
5·8·21·1							RL				1			W	FBR
5·8·21·13							RL				1			W	FBR
5·5·21·4			D-LL			LL					1			RL, D, P	I
5·2·21·10						RL	LL				2			W	DF
(5) 5·4·21·3	D-LL		D-RL				RL				2			W	CR FBR

Stratum 8	Scalloped	Denticulate	Other Unifacial Conchoidal	Bifacial Serrated	Other Bifacial	Ventral Unificial Nibbling	Dorsal Unifacial Nibbling	Alternate Nibbling Same Face	Edge Fracture	Bifacial Nibbling	Total No. Utilized/Retouched Edges	Projections	Alternate Unifacial Facial Retouch Same Edge	Missing Edges	Flake Type	
5·7·22·2			V-RL								1			D, P, LL	CR FBR	
5·6·22·6							LL, D				3	Round RL/D		W	FBR	
5·2·22·7						LL	LL				1		LL	P	I	
5·2·22·9						LL	RL				2			W	FBR	
5·4·22·3							LL				1			W	SSBCR	
5·8·23·1							LL				1			W	FBR	
6·3·19·1		LL									1			RL	Core	
6·8·20·9						LL					1			W	DF	
6·7·20·11							RL, LL				2			W	FBR	
6·6·21·6	D/V-R D-LL										2			D	DF	
6·2·21·3		D-D									1			P	Thick FB	
6·1·21·2					LL						1			W	DF	
6·1·21·1					D, P RL		LL		RL		4			W	Thick FB	Adz
7·1·18·3		D-RL D-LL									2			W	Thick FB	
7·9·19·1							LL				1			W	Thick FB	

Stratum 8	Scalloped	Denticulate	Other Unifacial Conchoidal	Bifacial Serrated	Other Bifacial	Ventral Unificial Nibbling	Dorsal Unifacial Nibbing	Alternate Nibbling Same Face	Edge Fracture	Bifacial Nibbling	Total No. Utilized/Retouched Edges	Projections	Alternate Unifacial Facial Retouch Same Edge	Missing Edges	Flake Type	
7·6·20·1			D-RL D-LL D-D								3			P	I	
8·1·20·1				RL, LL							2	Point LL/RL		W	FBR	
8·8·19·1			RL, LL D								3			W	Thick FB	End- Scraper
9·8·22·1				U-LL							1			W	CR FBR	
9·3·(13)·2					RL						1			W	Thick FB	
10·1·20·8							LL				1			W	Thick FB	
10·7·21·2		V-D									1			W	DF	
10·9·23·2	D-RL										1			LL	FBR	
11·7·11·3				RL		LL					2			D	CR FBR	
11·7·11·5	D-LL										1			W	FBR	
11·6·11·1							LL, RL				2			W	FBR	
11·8·11·6									RL		1			D	FBR	
11·1·11·2					P						1			D, LL, RL	I	Adz
12·6·19·1				RL			P, D, LL				4	Graver RL/D		W	CR FBR	End- Scraper

Stratum 8	Scalloped	Denticulate	Other Unifacial Conchoidal	Bifacial Serrated	Other Bifacial	Ventral Unificial Nibbling	Dorsal Unifacial Nibbing	Alternate Nibbling Same Face	Edge Fracture	Bifacial Nibbling	Total No. Utilized/Retouched Edges	Projections	Alternate Unifacial Facial Retouch Same Edge	Missing Edges	Flake Type	
12·6·20·2						LL					1			W	FBR	
12·9·20·3							LL				1			RL	SSBCR	
14·7·21·2			D-LL								1			P, RL	I	
15·5·20·3		V-LL	V-RL			LL, RL					2			D	DF	
15·1·20·1		D-LL									1			P	SSBCR	
16·6·20·2			V-RL			RL					1			W	SSBCR	
16·3·20·1		V-LL			RL						2			W	SSBCR	
16·1·19·2			D-RL V-LL			RL	LL				2			D	CR FBR	
1·6·21·6						LL, RL D					3			W	DF	3
1· ·21·12							LL				1			W	FBR	2
1·5·20·7					RL					LL	3	Notch D-RL		P	FBR	3
1·6·21·7							RL				1			P	FBR	3
13·7·21·5			V-RL				LL				2			W	CR FBR	3
2·3·19·1			D-LL		RL						3	Point LL/RL		W	SSBCR	3
10·6·20·4			V-LL		RL						3	Point LL/RL		W	FBR	3

2) *Adzes* are represented by three specimens, 2·6·20·8, 6·1·21·1 and 11·1·11·2. Specimen 6·1·21·1 (see Plate 16) measures 74mm x 40mm x 8mm and is particularly diagnostic of an adzing function due to its unusual morphology. The dorsal surface of the flake is composed entirely of a soft cobble cortex. Unlike the more dense composition of the interior material, this cortex was soft enough to leave irrefutable evidence of striations that are macroscopically visible. They occur only on the dorsal surface and are associated with heavy polishing. Polish and striations are absent on the ventral flake surface flake indicating a predominantly unifacial wear pattern (see Plate 16). Under 4x magnification the striations of the dorsal surface follow a course roughly parallel to the long axis of the flake and perpendicular to the transverse edges of the tool. This is definitely consistent with an adzing use (see Semenov 1964:126). Both transverse edges of the tool exhibit cursory marginal, bifacial retouch and heavy polish extending on to the dorsal, but not the ventral, surface of the flake. In both instances, the heaviest polish and the point of heaviest impact are located on convex prominences which jut out from the general subconvex outlines of the bit edges. Striations, however, are only observable on the less dense cortical areas and not on the edges where the raw material is considerably more dense. Examination of the non-cortical portions of the edges under 4x magnification also failed to detect striations. The lateral margins of the tool both exhibit edge dulling due to polish. The right lateral margin has been crudely chipped, predominantly unifacially, perhaps as an expedient to hafting.

The other two specimens are made from tertiary flakes and, as such, do not exhibit observable traces of striations. They were placed in the adz category, however, on the basis of: 1) the transverse orientation of their working edges; 2) the marginal, bifacial retouch of these transverse edges and 3) the predominance of unifacially extensive polish associated with these transverse edges. Specimen 12·6·20·8 (73mm x 34mm x 6mm) was manufactured from a side-struck flake of bifacial core reduction. The lateral edges have been expediently shaped to produce marginally retouched, bifacial edges. The distal edge has also been shaped by marginal, bifacial retouch and the natural curvature of the flake is adz-like (Semenov 1964:126). A slight facial polish occurs across the retouch scars of one face. Specimen 11·1·11·2 (38mm x 39mm x 7mm) corresponds to what has been referred to in the literature (see Gould 1971 and Hayden 1979) as an adz flake. It constitutes a distal (bit) end fragment of an adze. The bit is ovate in outline and is shaped by marginal bifacial retouch. Polish is predominantly unifacial, extending approximately 10 to 15mm onto the surface of one face. The edge is heavily polished. The other face is only slightly polished, generally on the prominences immediately adjacent to the edge.

3) *Scalloped-edge flakes*, the third category of flake tool, have not been discussed previously (see Plate 16). This artifact appears to have been first recognized as a tool in Wilson's report of the 1974 excavations at 31Ch29 (1976:53, Plate VIIc, right end of row). The item was pictured and referred to only as a piece of worked slate without an accompanying discussion. It became obvious in our course of analysis of materials from 31Ch29

that this tool constituted a major flake tool category and had a definite, circumscribed cultural-historical distribution. It first appears in the lamella 8 occupation, is most abundant in the lamella 7/6 (Le Croy/Kirk II) assemblage and gradually decreases through the Morrow Mountain occupations.

The descriptive term "scalloped" has been applied to characterize the distinctive edge outline and retouch technique. Scalloped retouch is generally applied to thin flakes (see Figure 9.10). Pressure is applied unifacially at approximately 2 to 3mm from a thin edge and a "half-moon" shaped spall is removed. The result is a steep, concave scar generally measuring between 5 and 10mm in length and approximately 2 to 3mm in depth along an edge. This technique is generally repeated once or twice more along an edge creating a special kind of denticulated edge with sharp points occurring at the intersection of scars. The concavities are generally steep ranging from 90° to 60°, but the wear is consistently confined to the point tips, the prominences forming the points and the upper edges of the concavities (see Figure 9.10). Wear is manifested as a very slight polish limited primarily to the medial aspect of the ridges described above. Points are always sharp suggesting that sawing would be an inappropriate use for such tools. The alternative use of light shredding is more likely. Shredding of vegetable matter is one possible use, but the proximity of the river makes fish-scaling also likely. Questions regarding the uses of scalloped-edge tools should definitely be addressed with controlled experimentation.

Scalloped edges occur on six of the flake tools from the lamella 8 occupation (refer to Table 9.24). These edges appear independent of other types of retouch or wear on four of the specimens, while the remaining two specimens are associated with unifacially retouched or worn edges.

4) *Denticulated* edges occur on nine of the flake tool specimens (see Table 9.24 and Plate 16). These edges are characteristically associated with a larger, thicker set of flake tools ($\bar{x}$ weight = 40.89 gms., s = 23.74 gms.; $\bar{x}$ thickness = 15.44mm, s = 6.65mm). As a category, denticulates are relatively self-contained. Only three of the nine flakes from this category exhibit other types of edges (two unifacially retouched or worn edges and one marginal, bifacially retouched edge). Edge angles range from 70° to 46° with a mean of 59.83° and a standard deviation of 6.66°. Wear is predominantly of two types: 1) unifacial step fracturing in the hollows of the teeth and 2) a light polish confined to the medial aspect of the denticulate edge in both hollows and teeth. Striations, again, were unobservable. If indeed these tools were used for sawing, then they must have been used in a one-way motion since the wear is predominantly unifacial. Semenov (1964:19) comments:

> In two-way sawing the edges of the hollow are slightly worn and the projections worn down from both sides, in one-way sawing from one side (for example, the front side of the projection and the back edge of the hollow if the one-way sawing is done in a forward direction).

The large size of the teeth (averaging 7 or 8mm in width) suggests that these tools may have been more effective on larger objects such as long bones or larger tree branches. The luster of the polish remains semi-matte, which may be a function of the character of meta-volcanic rock, preventing discrimination between Keeley's (1980) criteria for bone or wood polish.

5) Serrated edges occur on eight flake tools. Serration was applied unifacially on four of the flakes and bifacially on four. In four cases serrated edges are associated with unifacially worn or retouched edges; in one case a serrated edge occurs on an endscraper, in two cases they occur alone, and in one case two serrated edges on one flake form a point. In contrast to the denticulate category, serrated edges occur on relatively thinner, smaller flakes ($\overline{x}$ = 11.00 gms., s = 6.86 gms.; $\overline{x}$ thickness = 7.25mm, s = 1.98mm) Central edge angles range between 38° and 69° with a mean of 51° and a standard deviation of 8.46° (n = 9). Wear consists of a faint, dull polish along the medial aspect of the edge and along the tips of serration prominences. The thinness of the edges, the reasonably low edge angles and the dull polish suggest use in meat cutting.

6) Unifacially retouched or worn edges (see Plate 16) compromise the largest category of the situational gear. Edges of this type occur on 60 of the 73 flakes which compose the flake tool class. A total of 84 edges exhibit unifacial wear or retouch of which 18 are retouched and 66 are unretouched. These edges occur with other edge types on only 13 flakes: 1) twice with denticulate edges; 2) twice with scalloped edges; 3) five times with serrated edges and 4) four times with marginal, bifacially retouched edges (i.e., 33 percent of scalloped tools, 22 percent of denticulates, 33 percent of marginal, bifacially retouched tools and 63 percent of serrated-edge tools). The serrated-edge tools may in fact be highly correlated with unifacial tools whereas the other categories are only weakly associated. The sizes and edge angles of this group of tools is more variable than those discussed previously but the wear characteristics would suggest one-way cutting and/or scraping as the primary actions of this category.

7) Marginal, bifacially retouched edges, the final category, can be found on 12 edges in the assemblage. These edges co-occur with unifacial tools four times and denticulates once. The other seven edges occur alone. The size of flakes on which these edges occur is again variable.

It is obvious that the situational component of the lithic assemblage has increased substantially in complexity between the Palmer occupations and the lamella 8 occupation. This increased complexity is primarily seen in functional edge types and not in the complexity of individual flake tools . The number of edges used per flake and the number of different uses per flake increase slightly but are not substantially different. In fact, the former measure is greater in Palmer I than in Kirk I/St. Albans. Increased complexity can be seen in functional diversity where unifacial edges decrease in relative importance, tool combinations and denticulates increase and scalloped edges appear for the first time. Specimen 2·7·21·4 (see Plate 16) is an example of a tool combination exhibiting three unifacial

edges and two graver spurs. The number of functional categories increases dramatically including adzing, graving, endscraping, points, and as well as the five edge treatments (i.e., scalloped, denticulate, unifacial, serrated and bifacial). On this basis, functional diversity of flake tools can be seen to significantly increase between the Palmer and Kirk I/St. Albans site occupations. Functional diversity of flake tools can be compared as follows:

	Scalloped (7) percentages	Denticulate	Unifacial	Serrated	Bifacial	Combinations
Palmer		(2) .04	(39) .76	(4) .08	(4) .08	(2) .04
Kirk I/ St. Albans	(6) .05	(9) .07	(84) .65	(8) .06	(12) .09	(9) .07

The following comparison may be drawn between the complexity of tools from the Palmer and Kirk I/St. Albans occupations:

	Palmer	Kirk I/St. Albans
Number of edges used per flake	57/34 or 1.68	127/73 or 1.74
Number of different uses per flake	41/34 or 1.21	94/73 or 1.29
Number of functional categories	5	10

Miscellaneous cores comprise the final situational artifact class in the lamella 8 occupation. Four of these items represent river-worn cobbles of latite felsite (Raw Material C) which could be potentially used in flake and tool production. Specimen 8·5·17·19 is a tabular piece of material that was cursorily chipped at one end, presumably to determine the suitability of the material for knapping. It weighs 145 grams and is 99mm x 53mm x 19mm in metric dimensions. Specimen 4· · 19·3 has been similarly chipped at one end to expose the nature of the raw material (weight = 419 gms., 192mm x 66mm x 34mm). Specimens 6· ·21·7 (weight = 822 gms., 186mm x 66mm x 56mm) and 9· ·13·1 (weight = 1345 gms., 195mm x 110mm x 47mm) are unmodified cobbles which exhibit areas of natural exposure.

Specimen 2· ·20·11 is an expedient multi-directional core of andesitic felsite (Raw Material B). It weighs 157 gms. and measures 51mm x 53mm x 37mm. Specimen 3· ·18·7 is also a multi-directional core made of quartz (Raw Material F). It weighs 91 grams and is 51mm x 46mm x 31mm in metric dimensions.

Specimens 5· ·22·8 and 10· ·21·5 are quartz core fragments weighing 72 grams and 12 grams respectively. Finally, Specimen 4·8·21·1 is a small, blocky piece of chalcedony (Raw Material P) that has been flaked by the bi-polar technique (weight = 14 gms., 26mm x 20mm x 17mm).

Lamellae 7/6 Occupation Floor — LeCroy/Kirk I and II/Stanly

Decreased depositional rates (see Chapter 6) combined with increased occupation intensity made it impossible, given our excavation technique, to determine whether the material described as the LeCroy/Kirk II Occupation Floor was actually several superimposed surfaces or simply one extensive exposed surface. Artifactual distributions could be associated with lamellae 7 and 6 which blended with and bifurcated from each other frequently. Unable to devise a method to objectively discriminate between occupational debris which might be associated with one or the other lamella, we decided to treat this stratigraphic zone as a single occupational band.

The material culture from this floor is associated with four established cultural-historical phases: LeCroy, Kirk I, Kirk II and Stanly. Although Lewis and Kneberg (1955:79, 81), Kneberg (1956:27-28) and Broyles (1966:26-27 and 1971: 68-69) are credited with initial recognition of the LeCroy Bifurcated Stem (or Base) projectile point, it was not until Chapman's (1975; 1977) work at the Rose Island and Icehouse Bottom sites that the LeCroy phase received definitive status. In the cultural sequence of the Little Tennessee River Valley Chapman (1975:106-108 and 274) placed the LeCroy phase between the St. Albans and Kanawha phases. Radiometrically, this phase has been dated to around 6300 B.C. (Chapman 1975:214). Chapman (1975:274, 1977:166) views the LeCroy phase as part of a long established, continuous developmental sequence spanning the entire southeastern Early Archaic. The LeCroy Bifurcated Stem point is seen as a descendent form of the Kirk Corner-notched cluster (corresponding to the Palmer Corner-notched and Small Kirk Corner-notched of the Haw River sequence) and an antecedent of the Stanly cluster (Chapman 1977:54).

On typological grounds, however, Chapman's proposed sequence poses problems in interpreting 31Ch29. First, the relationship between St. Albans Side-notched and Small Kirk Corner-notched projectile points is brought into question. Chapman (1977:124-125, 1975:110) has demonstrated a clear stratigraphic separation between these point types in the Little Tennessee River Valley and has suggested that the varieties of small corner-notched points associated with the Kirk Cluster are antecedent to the St. Albans Side-notched type. In the Haw River sequence, however, a small corner-notched projectile point type, which is little different and clearly derivative from the Small Kirk Corner-notched type of lamella 8, is significantly distributed across the lamellae 7/6 floor. Stratigraphically, the St. Albans Side-notched type at the Haw River is clearly superior to this type. Moreover, this small corner-notched point exhibits many characteristics which would make it a more suitable bridge between the Small Kirk Corner-notched and the later Kirk Stemmed and Serrated (see Coe 1964:70, Figures 60 and 61) and Stanly Cluster types (see Coe 1964: 35-37 and Chapman 1977: Figure 15, 34-35) than the LeCroy-Kanawha-Stanly sequence developed by Chapman (1977:125).

The stratigraphic position of the LeCroy Bifurcate Stem type cannot, unfortunately, be evaluated in light of these issues. Debris from the LeCroy and second occupation of the Kirk I phases is intermixed with the first Kirk II phase occupation. This latter phase is identified by the presence of Kirk Stemmed (Coe 1964:70) projectile points. There are also small numbers of projectile points corresponding to categories 13, 14, and 15 of Chapman's (1977:32-25) Stanly Cluster.

When considering the stratigraphic and typological relationships of projectile points between lamellae 8 and 7/6, it is difficult to ignore the possibility that the St. Albans-LeCroy and the Kirk I-Kirk II phases represent separate cultural traditions in Piedmont North Carolina. Chapman's (1975:252, figure 16) distributional map for the bifurcate tradition indicates that the Haw River site group is located at the edge of this distribution. Coe (in Chapman 1975:255) has observed that although bifurcate projectile points are found in all physiographic provinces in North Carolina, their frequency of occurrence is less nearer the coast. When these points occur in the coastal plain they are invariably manufactured from Piedmont raw materials. Large-scale regional surveys conducted in piedmont South Carolina by the Institute of Archeology and Anthropology (see House and Ballenger 1976; Taylor and Smith 1978; Cable, Cantley and Sexton 1978; Goodyear 1978, and Cable and Cantley n.d.) serve as excellent testimony to the rarity of these styles. Taylor and Smith (1978) reported the only bifurcate finds, and these amounted to just a few cases. Therefore, it is quite probable that the piedmont South Carolina corner-notched point tradition developed independently of a bifurcate sequence. Recent excavation by Ward (pers. comm.) has substantiated the occurrence of bifurcate projectile points at the Hardaway Site, but Coe's reluctance to incorporate bifurcates into the Hardaway sequence serves, again, as excellent testimony to the marginal presence of the tradition in the Piedmont of North Carolina. He envisions the Piedmont projectile point sequence as a "continuity of style which developed from the Palmer Corner-notched into the Kirk Corner-notched, thence into the Kirk Stemmed and the Kirk Serrated and, subsequently into the Stanly Stemmed, to finally terminate in the Savannah River Stemmed projectile point type." (Coe 1964:70). A total of only 15 bifurcate projectile points (8 St. Albans Side-notched and 7 LeCroy bifurcate Base) were recovered from the entire Haw River site group excavation.

Turnbaugh (1972:8) suggests the possibility of a localized development of the bifurcate tradition out of a mountain-based Kirk phase. The gradually increasing frequency of the bifurcate tradition in the more northerly portions of the Piedmont, along the Atlantic Coast and in the interior lowlands of Indiana, Ohio, Kentucky, Illinois and Michigan (see Chapman 1975:154-263) suggests that the bifurcate phases may represent systems whose most southern penetrations into Georgia and South Carolina were conditioned by the altitudinal temperature gradient of the Appalachian Mountains. Under this model, the bifurcate presence in the Haw River site group area would represent the edge of an intrusive adaptive system developing simultaneously with a Southern Piedmont tradition which also originated from another localized Kirk phase. This would indicate a cultural sequence

for the South Appalachian Piedmont and Coastal Plain which would move from a general corner-notched projectile point tradition into a Stemmed tradition without an intermediary Bifurcate Base tradition. If this model proves to be an accurate characterization of the broad scale demographic and adaptive patterns of the 7000 to 6000 B.C. time period in the Southeast, then the dynamics of interaction between these two macro-traditions should constitute a major research topic.

I. . Personal Gear, as in lamella 8, consists of only two classes of artifact: 1) Projectile points and 2) Bifaces.

Projectile Points have been divided into three major types: 1) small Kirk Corner-notched; 2) Kirk Stemmed and Stanly Cluster and 3) LeCroy Bifurcate Stem.

1) Small Kirk Corner-notched: The similarities between the 20 diagnostic corner-notched projectile points (see Plate 13) from lamellae 7/6 and the Small Kirk Corner-notched sample from lamella 8, suggest a second, later Kirk I phase occupation. Table 9.25 presents summary statistics on the metric dimensions of this sample, indicating that the statistical parameters of this sample are indeed very similar to the lamella 8 sample. There are some differences which can be interpreted as directional changes in the design of the tool. Slight increases occur in thickness, base width, tang width, shoulder width, blade width 2, tang length and notch length. The only decrease is in blade length. Examining these changes in terms of two sample differences of means tests (t-tests) indicates that significant changes occur only in four dimensions (see Table 9.26). The haft element undergoes a general increase in length and width of the tang and width of the base. This trajectory appears to foreshadow the enlargement of the tang in the *Kirk Stemmed* type. Blade length is significantly shorter in the lamellae 7/6 sample indicating that axial shortening is much more prominent as a resharpening technique.

Slight basal grinding occurs on 9 of the 20 speciments. Late stage blade resharpening continues to associate highly with serration. Also, the same life-history transformations occur as discussed for the lamella 8 sample.

		Excurvate	Recurvate	Recurvate Serrated	Straight Serrated	Straight	Incurvate Serrated
Late Stage	⟨50°			1	1		3
	50°-60°			1	3		2
Early Stage	⟩60°	1	1				

Coe (1964:70) observes that, on typological grounds, the Kirk Stemmed projectile point is "midway between the Kirk Corner-notched and the Kirk Serrated types." Since Coe did not recognize the Small Kirk Corner-notched type at the Hardaway site, it was

Table 9.25
Summary Statistics, projectile point types from Lamellae 7/6 occupation

	Small Kirk Corner-notched			Kirk Stemmed			LeCroy Bifurcate Stem			Stanly Cluster		
	n	$\overline{x}$	s	n	$\overline{x}$	s	n	$\overline{x}$	s	n	$\overline{x}$	s
Thickness	18	9.00	2.77	14	10.00	1.16	9	6.56	1.13	7	8.43	1.51
Base Width	20	20.90	2.53	13	17.92	2.56	7	18.14	2.61	7	16.28	3.73
Tang Width	20	16.55	3.17	17	17.89	2.61	8	17.00	2.88	7	16.43	0.79
Shoulder Width	17	23.71	2.85	12	34.08	2.81	8	25.13	5.36	7	31.57	2.07
Blade Width 2	17	15.71	5.22	12	17.75	2.02	6	20.00	6.29	7	22.00	2.71
Axial Length	17	44.94	11.90	8	69.25	11.44	3	42.67	4.04	6	46.50	4.85
Tang Length	18	13.89	2.14	13	15.92	2.96	8	13.25	2.05	7	13.57	2.51
Blade Length	17	31.12	10.91	9	51.44	10.43	3	29.67	3.79	6	33.33	3.33
Notch Length	18	9.89	3.79	11	16.73	3.52	7	11.71	3.55	7	13.71	2.69
Edge Angle	102	63.35	9.09	71	66.25	8.51	36	48.31	15.59	40	55.40	9.31

natural to conclude that the large Kirk Stemmed type represents a direct development out of the large Kirk Corner-notched type (ie. the Palmer Corner-notched projectile points of the lamellae 14/13 and 12/11 occupations at 31Ch29). However, subsequent excavation at the Icehouse Bottom site by Chapman (1977:27, 41-51) established a clear separation between a stratigraphically superior (lower Kirk) large, deeply corner-notched, ground base projectile point type (category 38) and a range of smaller corner-notched types (categories 24 through 35) in the Upper Kirk levels. Chapman (1977:51) likens his Category 38 to the Lost Lake type (Cambron and Hulse 1969:46), the Plevna type (De Jarnette et al. 1962:66; Cambron and Hulse 1969:97) and the Charleston Corner-notched type (Broyles 1971: 56-57). The description and metric statistics of this point type correspond closely with the Palmer Corner-notched types of the Lamella 14/13 and 12/11 occupations of the Haw River excavations. Radiocarbon dates from stratum 0 of the Lower Kirk component at Icehouse Bottom yielded dates of 7485±270 B.C. and 6765±140 B.C. (Chapman 1977:185), but the former date (7485±270 B.C.) is more credible.

Smaller corner-notched projectile points occur stratigraphically above this earlier type at both Icehouse Bottom and 31Ch29. Chapman projects a temporal range of between 7500 to 6500 B.C. for the Upper Kirk strata (Chapman 1977:185). A great amount of variation is seen in the styles of corner-notched points from this Upper Kirk horizon (Chapman 1977:53), and Chapman contends that these styles derive from 12 separate occupations (1977:185). Basal grinding decreases in frequency and there is a marked diminution in the size of points compared to the Lower Kirk horizon. Table 9.27 displays data on the various corner-notched categories derived from the Upper Kirk Horizon at Icehouse Bottom. This variability in size, although stratigraphically ambiguous, should constitute a fairly accurate view of the trajectory of change between the large, deeply corner-notched, ground base type and the later small corner-notched forms. The deep corner-notched forms (categories 24, 28, and 29) correspond well with Coe's (1964:69-70) Kirk Corner-notched type, a form which is missing from the Haw River sequence. It will be remembered that the Palmer Corner-notched types from lamellae 14/13 and 12/11 exhibited all of the size enlargements associated with the Kirk Corner-notched type, but all specimens showed basal grinding. In the Haw sequence, the significant changes between the Palmer Corner-notched (occupation III) type and the lamella 8 Small Kirk Corner-notched type are in the width of shoulder, base and tang. Tang length and blade length remain relatively unchanged, but are slightly larger in the latter type. By the lamellae 7/6 occupation, the small Kirk Corner-notched type increases, most dramatically, in tang length over the lamella 8 sample. Also, base and tang width increase significantly, but a similar tang width to base width ratio is maintained indicating no significant change in hafting strategy. Finally, blade length at discard decreases significantly indicating an increased emphasis on axial shortening as a blade resharpening technique. Basal grinding continues, but occurs on a lower proportion of specimens and generally decreases in intensity.

Table 9.26

One-tailed difference of means tests for Small Kirk Corner-notched — Kirk Stemmed — Stanly Cluster Sequence (significant differences at the 0.5 level are indicated by asterisks in probability columns)

	Small Kirk Corner-notched Lamella 8 vs. Lamellae 7/6		Small Kirk Corner-notched vs. Kirk Stemmed, Lamellae 7/6		Kirk Stemmed vs. Stanly Cluster, Lamellae 7/6	
	t-value	Probability	t-value	Probability	t-value	Probability
Thickness	0.1764	P>.10	2.5902	.01>P>.005*	1.9899	.05>P>.025*
Base Width	2.3571	.025>P>.01*	3.5078	.005>P>.005*	1.6124	.10>P>.05
Tang Width	1.9297	.05>P>.025*	0.6219	P>.10	1.3700	.10>P>.05
Shoulder Width	1.5540	.10>P>.05	3.4768	.005>P>.0005	1.8648	.05>P>.025*
Blade Width 2	0.7839	P>.10	0.9886	P>.10	3.1235	.005>P>.0005*
Axial Length			7.1701	.0005>P*	3.7113	.005>P>.0005*
Tang Length	2.4332	.025>P>.01*	1.6818	.10>P>.05	1.3093	P>.10
Blade Length	1.8292	.05>P>.025*	4.3674	.0005>P*	3.6827	.005>P>.0005*
Notch Length	1.5617	.10>P>.05	4.3412	.0005>P*	1.4290	.10>P>.05
Edge Angle	1.4024	.10>P>.05	3.0346	.005>P>.0005*	6.0154	.0005>P*
Tang Width/Base Width Index	0.5540	P>.10	4.1046	.0005>P*	1.2327	P>.10
Blade Width^2/Shoulder Width Index	0.4518	P>.10	2.5991	.01>P>.005*	4.0540	.005>P>.0005*

Table 9.27
Metric statistics on Chapman's Kirk Corner-notched Cluster from the Upper Kirk Strata at Icehouse Bottom (1977:41-51)

	Category	Descriptive Name	Basal Grinding	$\bar{x}$ Length (mm)	$\bar{x}$ Width (mm)	$\bar{x}$ Thickness (mm)	$\bar{x}$ Stem Length (mm)	$\bar{x}$ Stem Width (mm)
LARGE	24	Kirk Corner-notched, Large Variety	40%	41.8	26.0	6.9	9.5	23.6
	28	Deep Corner-notched, Excurvate Unground Base	None	31.8	30.7	7.1	8.9	25.1
	29	Deep Corner-notched, Straight Unground Base	None	39.4	27.9	6.8	8.4	20.0
SMALL	25	Kirk Corner-notched, Small Variety	None	30.8	19.3	5.9	6.9	19.8
	26	Kirk Corner-notched, Narrow Variety	Only one specimen, probably a reworked example of Category 25.					
	27	Small Corner-notched, Excurvate Base	None	25.7	18.6	5.7	7.8	19.8
	30	Corner-notched, Small Excurvate Base	33%	32.3	20.9	6.5	7.8	16.4
	31	Kirk Corner-notched, Small to Medium	100%	32.9	23.2	6.7	8.8	22.1
	32	Small Corner-notched, Excurvate Ground Base	100%	24.8	18.5	5.9	8.3	21.8
	33	Kirk Corner-notched, Small with Ground Base	100%	30.7	18.5	6.1	7.8	18.4
	34	Corner-notched, Assymetrical Flake	None	26.4	18.2	4.5	5.5	12.6
	35	Decature	100%	34.1	23.1	5.2	5.9	20.3

2) Kirk Stemmed: A total of 17 diagnostic whole and broken projectile points from the lamellae 7/6 occupation floor have been typed as Kirk Stemmed. Specimen 1·9·14·10 actually occurs in the lamellae 5/4 floor, but its final provenience is most likely a result of the reverse stratigraphy in the area of Excavation Unit 1 (see Chapter 6).

Coe (1964:70) describes this type in the following manner:

> Summary description: a long dagger-like blade with deep serrations and a broad stem.
>
> Form:
>
> (1) Blade: Long, narrow, and thick. The edges were concave toward the base but recurved toward the point. Serrations were deep, especially in the concave area.
>
> (2) Base: straight or slightly rounded.
>
> (3) Corner-notches: Broad notches that produced a stem that expanded slightly toward the base and shoulders that projected slightly backward.
>
> Size:
>
> (1) Length: Range, 70mm-150mm; average, 35mm.
>
> (2) Width: Range, 30mm-50mm; average, 35mm.
>
> (3) Thickness: Range, 8mm-15mm; average, 10mm.

The geographic distribution of Kirk Stemmed projectile points is not well established. Broyles (1971:67) states that this point type occurs from "northern Alabama to Pennsylvania and west into Ohio and Kentucky." She adds that it is a relatively uncommon type. Chapman (1975:120) reports only two examples of projectile points with possible affinities to the Kirk Stemmed type. He concedes that they "may be variants of the established Kirk Stemmed type." At Icehouse Bottom Chapman reports the presence of three projectile points identified as Kirk Serrated/Kirk Stemmed and observes that the type "is not common in the lower Little Tennessee River Valley" (Chapman 1977:37).

Neither is the stratigraphic placement of the Kirk Stemmed type well established. Broyles (1971:67) stated that it "should occur above Kirk Corner-notched and below St. Albans Side-notched." However, two of the five examples from the St. Albans Site excavations occurred in the Kanawha Zone 4 (Broyles 1971:67), well above St. Albans

Side-notched. The other three examples, though, derived from Kirk Zone 16 which is consistent with her interpretation. Coe (1964:70) views the Kirk Stemmed type as a bridge between the Kirk Corner-notched and Kirk Serrated types. Chapman (1975:120) states that the stratigraphic placement of the examples from Rose Island is unclear, but the only excavated example is associated with the LeCroy horizon. At Icehouse Bottom (Chapman 1977:27) one of the examples of Kirk Serrated/Kirk Stemmed comes from Stratum G in association with the LeCroy Bifurcated Base type, and the other two examples derive from Stratum D in association with the Stanly Cluster. Chapman (1977:37) would contend that this type should occur stratigraphically above the bifurcate tradition levels.

The Haw River stratigraphy indicates a strong association again with Stanly Cluster and LeCroy Bifurcate Base diagnostics. It is clearly above Small Kirk Corner-notched and St. Albans Side-notched. An issue raised by the Haw River data, however, is whether the phase associated with the Kirk Stemmed type is culturally affiliated with the Bifurcate phases. Chapman's (1977:123-126) cultural-historical reconstruction for the Little Tennessee River Valley portrays a sequence in which the Bifurcate point tradition develops out of the Kirk Corner-notched tradition and gives rise to the Stanly Cluster. The Kirk Stemmed type would be placed in the transition between the Bifurcate and Stanly phases, presumably developing out of the Kanawha phase. Coe (1964:70) views the Kirk Stemmed/Kirk Serrated types as antecedent to the Stanly Stemmed type also, but he sees its origin as directly related to the Kirk Corner-notched type in the North Carolina Piedmont sequence.

The Haw River sequence is complicated by the continuance of the Small Kirk Corner-notched style on the lamellae 7/6 occupation floor. If the St. Alban's Side-notched were simply derived from the Small Kirk Corner-notched type, then why does the Small Kirk Corner-notched post-date it and occur in the lamellae 7/6 occupation within the LeCroy Bifurcated Base type, as well as occuring on the Lamella 8 floor? This contradiction points to some important differences between the Little Tennessee River sequence and the Piedmont sequences. For instance, why are the Kirk Stemmed/Serrated types rare and bifurcate types common in the Little Tennessee River Valley, while the opposite is true in the Piedmont? Closer examination of the coexisting adaptive system interpretation and possible arguments involving functional specialization merit consideration in light of these findings.

Table 9.28 displays means and standard deviations for the lamellae 7/6 Kirk Stemmed sample. One specimen, 4·1·18·1, exhibits a wide, indented base which is closer to a Kirk Serrated type than a Stemmed type, but it was not differentiated for this analysis. Table 9.28, lists the results of t-tests run against the Small Kirk Corner-notched sample from lamellae 7/6. The results indicate that the Kirk Stemmed type is substantially different in its metric dimensions. The only elements which remain statistically unchanged are tang width and blade width 2. Examination of the LeCroy Bifurcate Stem (Table 9.28) statistics indicate that it is equally dissimilar to the Kirk Stemmed type. Dramatic differences are seen in thickness, shoulder width, tang length, blade length and discard edge angle.

Table 9.28
Means and Standard deviations of Tang Width/Base Width and Blade Width 2/Shoulder Width Indices

	Tang Width/Base Width Index			Blade Width 2/Shoulder Width Index		
	n	$\overline{x}$	s	n	$\overline{x}$	s
Palmer Corner-notched (Occupation I)	6	77.17	5.67	7	68.71	4.95
Palmer Corner-notched (Occupation II)	5	76.80	4.79	7	64.43	9.05
Palmer Corner-notched (Occupation III)	6	75.50	6.53	6	77.33	13.27
Small Kirk Corner-notched (Lamella 8)	13	83.23	5.77	12	69.83	7.05
Small Kirk Corner-notched (Lamellae 7/6)	18	81.94	6.35	15	67.00	16.17
Kirk Stemmed (Lamellae 7/6)	13	98.62	13.56	11*	45.20	6.52
Stanly Cluster	7	105.86	26.99	6	69.86	8.65
St. Albans Side-notched	7	80.86	4.26	7	67.00	6.12
LeCroy Bifurcate Stem (Lamellae 7/6)	6	91.83	8.33	6	79.00	21.01

*Adjusted — Because most of the Kirk Stemmed projectile points had broken shoulder segments on one side, it was necessary to project whole shoulder widths to produce an accurate index value.

Two major changes can be seen to occur in the Kirk Stemmed type when compared to the Small Kirk Corner-notched. First, the blade undergoes a distinct transformation, doubling in length. This is accompanied by a large increase in blade area. The practice of lateral shortening in the Small Kirk Corner-notched type makes a straightforward comparison of original blade area impossible. However, using the longer blade dimensions of the lamella 8 sample, assuming a roughly straight blade edge, projected blade area dimensions for early stage projectile points involve a 173 percent increase for the Kirk Stemmed type (mean blade area for Small Kirk Corner-notched = 446mm^2, mean blade area for Kirk Stemmed = 1188mm^2). Blade shape at discard is extremely and consistently incurvate in the Kirk Stemmed sample as opposed to the Small Kirk Corner-notched sample which displays a wide range of variability ranging from excurvate to incurvate. This can be quantitatively expressed as the ratio of blade width to shoulder width (2 x 100). By using the geometry of a triangle values of this ratio can be correlated with blade shapes. A value of 50 equals a perfectly straight blade edge. Values below 50 express gradually increasing incurvature while values above 50 increase in the direction of excurvature relative to the shoulder. Table 9.28 indicates a mean value of 45.20 for the Kirk Stemmed sample while the Small Kirk Corner-notched produces a mean value approaching excurvature at discard, 67.00 and 69.83. The lamellae 7/6 Small Kirk Corner-notched sample exhibits a very high standard deviation indicating a good deal of variation in discard blade shape. It should be noted also that the Kirk Stemmed type is the only kind of projectile point which is consistently discarded with an incurvate blade. All others approach excurvature.

The second major change occurs in the haft element. Here, the tang increases in length by a mean difference of 1.5 to 2mm. Accompanying this is a shift from an expanded, corner-notched stem to a squared stem. This can be quantitatively expressed by the ratio of tang width to shoulder width x 100 . A value of 100 identifies a perfectly square stem. Values below 100 express an increasing tendency toward deep corner-notching while values above 100 express a tendency toward a contracting stem. Table 9.28 indicates that the Small Kirk Corner-notched samples contain values indicative of corner-notching, but are less deeply corner-notched than the Palmer Corner-notched types. Although the Kirk Stemmed type is described as having corner-removed stems, the level of corner-notching is quite slight. A value of 98.62 is obtained, which approaches a square stem. The high standard deviation indicates a range of stem curvature including both slightly expanding (notched) and slightly contracting. This, as will be discussed later, foreshadows the development of a contracted haft strategy which reaches full expression in the Morrow Mountain projectile point (Coe 1964:37-39, 43).

Grinding of the base appears to have virtually disappeared in the Kirk Stemmed type. Evidence of very slight abrasion, however, occurs on prominences along the edges of 10 of the 12 observable bases. It is likely that this can be attributed to abrasion resulting from contact with wood or bone shaft or foreshaft during use. The base of specimen 10·5·17·3

is particularly telling in this regard. A heavy, bright polish occurs along a portion of the basal edge adjacent to the proximal medical juncture of the haft element. The microtopography has been transformed into a gently curved or domed, smooth surface indicative of wood polish by Keeley's criteria (Keeley 1980:35).

Serration occurs on 12 of the 13 observable blades which, again, corresponds with late stage life-history as measured by blade curvature and edge angle. The mean discard edge angle (see Table 9.25) is 66.25° with a very tight range indicated by the low (8.51°) standard deviation. This might indicate that serration is a retouch technique especially designed for resharpening steep angled edges or it might, on the other hand, serve as a means to increase the cutting efficiency of steeper edge angles.

Stanly Cluster: A variable group of seven projectile points exhibit characteristics that correspond to Chapman's (1977:32, 34-35) cluster of four point categories (12, 13, 14 and 15) identified from the Stanly component at Icehouse Bottom. A radiocarbon date of 5840±215 B.C. (Chapman 1977:185) was associated with that component. These forms differ from Coe's (1964:35) Stanly Stemmed type which occurs in the lamellae 5/4 occupation floor to be discussed next.

Specimen 6·2·16·2 resembles Category 13, *Short Stem, Broad Blade, Notched Base* (Chapman 1977:34):

> Form: Blades are broad with excurvate blade edges. Seven specimens [out of 19] have slightly serrated edges. Shoulders are horizontal, stems are short and broad, and the bases are incurvate or slightly notched.

Specimen 6·2·16·2 exhibits a rounded, reshaped tip, the base has been notched, and the stem is slightly contracting.

Specimens 7·7·15·1 and 5·1·18·3 resemble Category 14, *Short Stem, Broad Blade* (Chapman 1977:34-35):

> Form: Broad blade with excurvate blade edges. Five specimens [out of 38] have slightly serrated blade edges. Shoulders are horizontal. The stems are short and broad and the bases are straight. Seven bases still exhibit cortex and two bases are unfinished. . . This point category differs from Category 13 only in the attribute of basal notching. The two categories are contemporary and are viewed here as variations within the Stanly Cluster.

Both specimens exhibit contracting stems with unfinished bases. 5·1·18·3 has a straight, slightly serrated blade outline while the blade of specimen 7·7·15·1 is excurvate in outline and is partially serrated along one blade edge.

The final four specimens, 8·9·15·1, 16·9·15·3, 14·5·18·9 and 11·6·4·3, are similar to Category 15, *Medium, Straight to Expanded Stem, Notched Base* (Chapman 1977:35):

> Form: Blades are broad with straight to excurvate edges. Seven [out of 13] have slightly serrated blade edges. Shoulders are horizontal. The stems are of medium length and width and the bases are notched. . . The points in this category share many attributes with the Stanly Stemmed type (Coe 1964:35). Nine points (69%) were recovered from Stratum D. Two points from Strata E and F suggest that this variant may be slightly earlier than Categories 13 and 14.

All specimens exhibit excurvate blades and Specimens 8·9·15·1, 11·6·4·3 and 16·9·15·3 have slightly incurvate bases while the base on 14·5·18·9 is unfinished and straight. Serration occurs on the blades of 14·5·18·9 and 11·6·4·3.

Metric dimensions of this group of points are presented in Table 9.25. Student's t-tests run against the means and standard deviations of the Kirk Stemmed sample (see Table 9.26) indicate that very few statistically significant changes take place in base width, tang width, tang length, notch length and the tang width to base width ratio. Thickness decreases sharply and the blade undergoes another transformation. Blade length decreases again, approaching the values of the Small Kirk Corner-notched type. Blade area also decreases (slightly more than 526mm^2) to values much closer to the earlier corner-notched type. Shoulder width decreases much less than blade length, proportionately. The blade outline is excurvate at discard and the mean edge angle at discard is 55.40°, significantly less than the Kirk Stemmed mean. In spite of the dramatic changes in the blade, the haft element changes only slightly. No statistically significant changes occur in base width, tang width or in tang length. The ratio of tang width to base width also changes slightly, but may indicate a general trend toward gradually increasing stem contraction (see Table 9.25). The index value for the Stanly Cluster is 105.86 compared to 98.50 for Kirk Stemmed.

3) LeCroy Bifurcated Stem: This projectile point type has been described by Lewis and Kneberg (1955:79, 81), Kneberg (1956:27-28), Broyles (1966:26-27 and 1971:68-69) and Chapman (1975:106-108 and 1977:37-39). Chapman (1977:37) describes the type in the following manner:

> Form: Generally, the points are small with triangular blades. The blade edges are straight to incurvate and 45 specimens (57 percent) have serrated blade edges. Most of the blades have been resharpened and some have been reduced to little more than the stem (Figure 17b). The shoulders are horizontal. The stems are straight and the bases are deeply bifurcated. Seventeen specimens (22 percent) exhibit grinding on the lateral edges of the stem and 13 (67 percent) have grinding in the bifurcation. At least one half of the specimens appear to have been made from a thin flake.

Chapman (1975:108 and 1977:40) indicates that the LeCroy Bifurcated Stem type is clearly above St. Albans Side-notched in the stratigraphic sequences of both Icehouse Bottom and Rose Island.

A total of nine LeCroy Bifurcated Stem projectile points were recovered from the lamellae 7/6 occupation floor (see Plate 13). These specimens (12·6·16·2, 12·6·17·2, 12·2·17·6, 12·2·16·3, 7·8·16·9, 12·6·14·1, 1·9·4·7, 13·6·16·1 and 2·4·15·1) exhibit a small, tightly clustered distribution on the floor, five of them deriving from Excavation Unit 12. Specimens 1·9·14·7 and 2·4·15·1 occur in the Lamellae 5/4 occupation, but are most likely from the lamellae 7/6 occupation. Their final provenience is probably a result of the reverse stratigraphy in the area of excavation Units 1 and 2 as discussed by Larsen (see Chapter 6).

Raw Material is consistently of a highly isotropic nature and ranges between green and black vitric tuffs. The raw material used to manufacture the St. Albans Side-notched sample from Lamella 8 is all of a single type of green tuff. Both of these types exhibit less variability in raw material selection than the relatively contemporary Small Kirk Corner-notched, Kirk Stemmed and Stanly Cluster types which tend to reflect the proportions of locally available raw materials. This might suggest a non-local origin for the bifurcate projectile points and adds credence to the functional specialization or co-existing adaptation hypotheses.

Specimen 12·6·16·2 exhibits an extremely incurvate blade perhaps indicative of drilling. The shoulders of Specimens 13·6·16·1 and 2·4·15·1 have been completely removed as a result of extreme blade resharpening. Specimen 12·6·17·2 is manufactured from the same gray vitric tuff as the above specimen. It exhibits an excurvate, heavily serrated blade. Specimens 12·2·16·3 and 7·8·16·9 exhibit transverse blade breaks. Serration appears along one edge of the latter specimen. Specimen 12·2·17·6 contains a short, straight blade with minute serration along one blade edge. One basal ear is missing.

Heavy grinding occurs in the basal notch of one specimen, 12·6·16·2 and grinding along lateral edges of the tang or stem occurs in all nine cases. Means and standard deviations for the metric dimensions and edge angles for this type are displayed in Table 9.28. As can be seen through a comparison with the data from the St. Albans Side-notched type, there is very little change between the types. The basic differences include two elements. First, shoulder width appears to increase with the LeCroy Bifurcated Stem type. Second, comparison of the tang width to base width indicates a definite trend toward a square stem in the latter type, a trend paralleling that of the Kirk Stemmed type.

One particular observation about raw material selection may in fact add stronger support to the functional specialization hypothesis. A set of nine whole and/or fragmentary projectile points are manufactured from a very distinctive raw material which elsewhere occurs exclusively with six scalloped-edge flakes (16·9·16·1, 4·4·16·1, 2·9·17·8, 6·9·14·3, 2·7·17·13 and 6·7·18·23), three thin unifacial tools (2·5·19·4, 8·6·16·9 and 8·6·16·10), two

marginally retouched bifacial tools (9·4·8·9 and 5·7·17·1) and one endscraper (5·2·17·5) in the lamellae 7/6 occupation. The raw material is a dark, grayish brown vitric tuff containing numerous light beige circular to globular inclusions. The associated projectile points are suprisingly of two different cultural-historical types, LeCroy Bifurcated Stem and Small Kirk Corner-notched (see Plate 13).

It is possible that the same raw material was used by two different groups that may or may not have been separated in time, but the rarity of the raw material strongly suggests that these two styles may have been manufactured by the same group of people during a single occupation of the site. If this is the case, then the geographic distributions of the two styles have interesting implications. The previously noted decrease of bifurcate points eastward across the Piedmont and the Coastal Plain might suggest that they were more effective in adaptive strategies closer to the mountains. If the same groups manufactured both styles, but used one style in the lowlands and the other in the mountains, then it could be suggested that the bifurcate design represents an adaptation to cooler environments. This suggestion is supported by the increased occurrence of bifurcate points at lower elevations in more northerly latitudes of Virginia, Maryland, Pennsylvania and New England (see Chapman 1975:248-263). Although it was stated earlier that the functional specialization hypothesis was considered the least likely of our three hypotheses, this information lends credence to this interpretation.

4) Fragments and Miscellaneous: In addition to the diagnostic types discussed above, five non-diagnostic projectile point fragments and one projectile point of questionable provenience are associated with the lamellae 7/6 occupation floor. Three tips (8·6·16·1/8·5·16·7, 7·4·18·1 and 4·1·17·1) were recovered, one of which (8·6·16·1/8·5·16·7) is probably associated with the LeCroy Bifurcate Stem Cluster. Two fragments were conjoined to produce a long, slender tip similar to the LeCroy Specimen 12·6·16·2. It was made of the same gray vitric tuff material as well. Specimen 2·6·17·7 is a long (86mm), slender (22mm), deeply serrated blade from a corner-notched projectile point. It is most likely associated with the Small Kirk Corner-notched occupation. Specimen 12·4·16·4 is a basal fragment with a slightly contracting stem and a square base. This might represent a Stanly Cluster category (13 or 14). The final Specimen, 1·5·21·3, is a crudely fashioned projectile point with a contracting stem. It may represent a Morrow Mountain point that has been displaced downward. On the other hand, it may correspond to Chapman's Category 12 of the Stanly Cluster. This point category represents a narrow, short stemmed form with an asymmetrical blade. The stems are not well formed, as is the case with this specimen, and are often not "more than a slight projection at the proximal end." (Chapman 1977:34)

Bifaces: A total of 104 whole or fragmentary bifaces were recovered from the lamellae 7/6 occupation floor. Thirteen of these were classified as biface/discoid cores based on their overall size and the sizes of flake scars on their faces. Seven were whole; the other six

represent large end fragments. Again, intermediate and immediate manufacture categories were indistinguishable. In this combined category are 95 whole bifaces or fragments, representing 91 individually recovered bifaces and four which were refitted during the course of the analysis.

There was much evidence of utilization in both categories, with 92 percent of the biface/discoid core group and 93 percent of the combined category showed wear. The basic wear pattern consisted, again, of polish extending entirely along the biface edges. Polish was observed to be unusually heavy on the transverse edges of 15 of the end fragments in the Combined Biface Category (marked with an * in the edge polish column in Table 9.29). The distribution of the polish would suggest an axing use; the character of the polish is consistent with Keeley's (1980:34) experimental findings concerning the nature of wood polish. A certain "greasy" texture on the areas of initial stage polish formation may, on the other hand, suggest meat polish (see Keeley 1980:53), in which case these bifaces may have been used in heavy duty butchering. The occurrence of the heaviest polish on the transverse edges of end fragments suggests that this group of artifacts are discarded because of breakage during the performance of a particular task. These broken bits represent primary refuse exhibiting total wear accumulated since the last resharpening. The intensity of polish on broken bits would vary according to the amount of use the tool received between its last resharpening and its breakage. Thus, tools with differing transverse edge polish may in fact represent the same use.

Three of the specimens from the biface/discoid core category (15·8·17·4, 15·9·17·3 and 4·4·17·4) appear to represent whole ax forms (see Table 9.29 and Plate 15). In contrast to the heavily worn appearance of many of the bit fragments, these specimens exhibit well maintained, relatively sharp transverse edges. The most noticeable polish occurs along the lateral edges of these tools, not the working edge.

A final wear characteristic that is present on nine of the specimens (see Table 9.29) from the lamellae 7/6 occupation is unifacial nibbling. This type of wear occurs along convex, transverse edges. These locations exhibit a plano-convex section approximating that of a unifacial tool. The wear pattern suggests a scraping motion. In most cases this pattern is associated with perimeter edge polish as well.

Thus, evidence of wear suggests that, besides meat cutting (which is probably associated with much of the light, edge perimeter polish), scraping and axing of wood and/or possibly animal resources were uses for which bifaces were enlisted. Specimen 11· ·5·3 (Plate 15) is an excellent example of an early stage discoid core. Flake scar patterns suggest that several flakes had been produced from the core, but there was no evidence of other uses.

Table 9.29
Data on bifaces from Lamellae 7/6 occupation

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight (gm)	
Biface/Discoid Core									
3·2·17·1	End	/Ovate		30	0.53	X			
3·7·16·6	Whole	Ovate/Ovate	61	78	21	0.75	X	98	
3·8·17·5	End	/Ovate			21	0.50	X		
4·6·17·1	End	Ovate/	80		21	0.62	X		
4·4·17·4	Whole	Ovate/Subrectangular	58	79	31	0.94	X	120	Ax
6·5·17·3	End	/Ovate	58		21	0.62	X		
8·7·15·2	End	/Ovate	77		22	0.38	X		
9·2·9·3	End	/Ovate			22	0.17	Quartz		
11· ·5·3	Whole	Discoid	68	82	33	0.65		214	
12·8·16·22	Whole	Ovate/Ovate	50	70	24	0.33	X	85	
14·6·19·13	Whole	Subrectangular/ Subrectangular	49	72	21	0.91	X	86	
15·9·17·3	Whole	Ovate/Subrectangular	47	90	19	0.90	X	78	Ax
15·8·17·4	Whole	Ovate/Ovate	48	98	18	0.64	X	86	Ax

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight (gm)	
$\overline{x}$			59.60	81.29	23.38	0.61	92%	109.57	
s			11.99	9.88	4.79	0.23		48.06	
Immediate/ Intermediate									
1·1·16·1	Whole	Ovate/Ovate	30	59	15	0.25	X	23	
1·3·18·4	End	/Ovate	34		8	0.60	Unifacial End Wear X		
1·4·19·3	End	Ovate/	48		11	0.83	X		
1·5·18·3	End	/Subrectangular			8	0.60	Heavy End* Polish X		Ax
1· ·20·8	End	Ovate/			6	0.50	X		
1·4·18·1	End	Lanceolate/			7	0.75			
2·4·18·7	Whole	Ovate/Ovate	27	42	16	0.60	Quartz	17	
2·6·17·1	Whole	Ovate/Subtriangular	36	47	6	1.00	X	11	
2·6·17·2	Midsection	Lanceolate/	34	43	14	1.00	X		
2·7·18·6	Whole	Ovate/Subtriangular	23	40	9	0.80	X	10	
2·1·18·1	End	Ovate/	35		6	1.00	X		
2·9·18·12	Fragment	Ovate			8	1.00	X		

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight (gm)	
Conjoined 7· ·19·2 2·6·18·5	Whole	Irregular/Ovate	47	66	12	0.33	X	40	
2·1·18·2	End	Ovate	42		16	0.60	Heavy End* Polish X		Ax
2·3·18·10	Whole	Ovate/Subrectangular	45	77	18	0.80	Unfacial End Wear X	57	
2·1·19·2	Lateral	/Subrectangular			10	1.00	Quartz		
Conjoined 3· ·17·6 3·8·17·7	Whole	Ovate/Ovate	43	63	11	0.83	X	36	
3·7·17·15	Lateral				8	1.00	X		
3·7·17·16	Whole	Truncated/Truncated	57	67	15	0.25		61	
3· ·18·8	End	Ovate/	48		13	0.86	X		
4·4·17·3	Whole	Ovate/Ovate	37	67	25	0.56	X	59	
4·4·17·5	Whole	Ovate/Ovate	41	62	18	0.50	Unifacial End Wear	40	
4·2·18·3	End	Ovate/			9	0.90	X		
4·6·16·5	End	/Subrectangular	43		13	0.63	Heavy End* Polish X		Ax

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight (gm)	
4·6·17·2	Midsection	Ovate/			13	0.63	Quartz		
5·6·18·5	Whole	Ovate/Ovate	36	48	14	0.56	Quartz	25	
5·5·20·2	Lateral	Ovate/Ovate	26	55	12	0.33	Unifacial End Wear X	20	
5·5·19·2	End	/Subrectangular	34		11	0.57	Unifacial* End Fracture X		Ax
5·4·19·3	Lateral	Ovate		49	8	0.60	X		
5·1·18·7	End	Ovate			9	0.80	X		
5· ·19·4	End	Ovate/					X		
6·4·18·20	Lateral	Ovate/		57	20	0.25	Quartz		
6·1·18·2	Whole	Ovate/Ovate	34	51	10	1.00	X	22	
6·9·18·24	Fragment	Ovate			13	0.63	X		
6·2·17·1	End	/Ovate	41		9	0.80	End Polish* X		Ax
6·5·18·8	End	/Subrectangular	34		12	1.00	Heavy End* Polish X		Ax
6·5·16·5	Lateral				7	0.75	X		

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight (gm)	
6·9·17·3	Midsection	Lanceolate/	34		12	0.50	X		
6·3·18·1	Whole	Ovate/Truncated	44	59	11	0.83	X	31	
7·2·16·2	End	/Subrectangular	35		11	0.83	X		
7·5·16·3	End	Ovate/			11	0.83	Quartz		
7·3·16·6	End	/Subrectangular	35		10	0.67	Heavy End* Polish X		Ax
7·2·17·5	Whole	Irregular/Ovate	46	82	19	0.90	Unifacial End Wear X	65	
8·4·15·1	Whole	Subrectangular/ Subrectangular	39	60	13	0.86	End Polish* Unifacial Wear X	34	Ax
8·3·17·4	End	Ovate			9	0.80	X		
8·7·14·2	End	Ovate/			9	0.50	X		
8·4·15·3	End	Ovate/			12	0.50	X		
8·4·15·2	Whole	Ovate/Ovate	27	55	12	0.50	X	17	
8·4·15·5	Tip Missing	/Subrectangular	26		8	1.00	Heavy End* Polish X	9	Ax
8·7·15·1	End	Ovate/			5	1.00	X		

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight (gm)	
9·5·8·3	End	Ovate/	35		8	0.60	X		
9·4·9·5	End	/Subrectangular	30		12	0.71	Heavy End* Polish X		Ax
9·8·10·7	Whole	Ovate/Subrectangular	21	38	13	0.63	Quartz	8	
9·9·9·8	End	Ovate/			13	0.44	Quartz		
9·1·9·1	Midsection				8	1.00	Quartz		
9·3·9·4	Midsection				9	0.80	X		
9·5·10·3	End	Ovate/			8	1.00	X		
9·1·10·1	Midsection				6	1.00			
10·4·18·6	Whole	Ovate/Truncated	37	67	18	0.64	Unifacial End Wear X	36	
10·2·5·15	Whole	Irregular	24	34	10	1.00	Quartz	7	
10·5·17·4	Midsection	Ovate/	25		8	0.60	X		
10·3·18·4	Midsection				9	0.80	X		
10·8·18·2	End	Ovate/	30		8	0.60	Unifacial End Wear X		
10·3·17·21	End	Ovate/	36		9	0.50	X		

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight (gm)	
10·7·19·8	End	Ovate/			7	0.75	Unifacial End Wear X		
10·1·18·1	Lateral	Hafted			7	0.75	X		
10·7·18·17	Midsection				11	0.22			
11·8·7·1	Whole	Ovate/Ovate	40	56	8	1.00	X	22	
12·5·16·15	Whole	Ovate/Subrectangular	36	47	12	0.71	X	18	
Conjoined 12·6·17·3 12·3·16·9	Whole	Ovate/Subrectangular	27	61	7	0.75	End Polish* Unifacial Wear X	14	Ax
12·8·16·21	End Missing	Discoid	52		9	0.50	X		
12·6·17·4	End	/Subrectangular			10	0.67	Heavy End* Polish X		Ax
12· ·17·8	End	Ovate			8	1.00	Quartz		
12·3·17·11	End	Ovate	39		14	0.75	Quartz		
12·1·18·1	Midsection				6	0.50			
12·5·16·8	Lateral	Ovate/			14	1.00	X		
12·9·15·1	End	/Subrectangular	34		10	1.00	End Polish* Unifacial Wear X		Ax

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight (gm)	
14·9·19·5	Whole	Irregular	45	61	13	0.86		32	
14·4·21·5	Lateral			48	25	0.67	Quartz		
14·8·20·11	Tip Missing	/Ovate	25		10	0.67	X		
15·6·18·4	End	Lanceolate/			8	1.00	X		
15·2·17·2	End	/Ovate	48		16	0.78	X	30	
15· ·19·2	Whole	Ovate Truncated/Truncated	30	36	18	0.80	Quartz	23	
15·2·17·1	Midsection				11	0.83	X		
15·8·18·7	End	Ovate/			10	0.43	Unifacial End Wear		
16·8·17·1	End Missing	Ovate/Truncated	30		15	0.78	X		
Conjoined 8·1·17·1 16·9·14·7	Whole	Ovate/Truncated	40	50	13	0.63	Heavy End* Polish X	25	Ax
16·6·15·1	Whole	Lanceolate/ Subrectangular	37	94	11	0.83	End Polish* X	40	Ax
16·3·16·6	Whole	Truncated/ Subrectangular	34	53	14	0.75	X	24	
16·2·17·6	Midsection		38		7	0.75	X		

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight (gm)
16·4·17·1	End	Ovate/			9	0.80	X	
$\bar{x}$			36.19	54.81	11.16	0.71	93%	28.53
s			7.84	15.77	3.93	0.22		16.03

smooth polish. The opposite lateral edge has also been bifacially retouched along the margin and exhibits polish. The microtopography of the edge has been transformed into a domed, bright, smooth polish. This polish extends onto both faces of the tool, but is only lightly present on the ventral surface. The prominences and portions of the flake scar hollows of the dorsal surface, on the other hand, exhibit intensive polish and moderate micro-topographic alteration. The unifacially dominant wear pattern suggests use as an adz (Semenov 1964:126) and the wear is consistent with the criteria for wood polish (Keeley 1980:35). The wear preservation on this tool is probably a consequence of primary discard resulting from breakage.

Specimen 2·6·18·4 represents a less elaborate tool which is retouched only along the bit edge. This marginal retouch, again, is bifacial. Polish is less prevalent on this specimen, but it is again predominantly unifacial, occurring on the ventral surface of the flake, which measures 63mm in length, 27mm in width, and 9mm in thickness.

3) Thick, Steep-edged Unifaces: The lamellae 7/6 occupation constitutes the first occupation since the Lamella 15 (Palmer I) occupation that contains a consistent and well defined group of large, thick, steep-edge angled unifaces. A total of 15 specimens (designated as "Thick Unifaces" in Table 9.30) were recovered from Block A. Table 9.30 displays metric and edge angle data for these unifaces. These tools are manufactured from large, secondary flakes derived from large cobbles or boulder outcrops in the vicinity. The mean edge angle is quite high, 66.81°, and values appear to be tightly clustered as indicated by a standard deviation of only 5.64°. The major wear pattern associated with these steep edges consists of unifacial, deep step fracturing and edge crushing. The step fracturing becomes so extreme in some cases that it undercuts the spine plane of the edge. Slight edge rounding occurs on most of the specimens, but polish is definitely absent. The overall size and steepness of the edge angles suggests a heavy duty scraping or planing use. Steep unifacial retouch occurs on 11 specimens, denticulate retouch on 2 examples and unifacial wear forms the steep edge on 2 specimens. Only one specimen, 9·9·10·9, has a second, acutely angled edge (50°), exhibiting bifacial nibbling as a result of use. The denticulate retouch may have no functional significance here, but may simply be a consequence of retouch. The thick uniface category appears to represent a very homogenous group of artifacts which were used for a single or constricted number of uses.

4) Large, Acute-Angled Cutting Tools: Another large flake tool category consists of 20 specimens with acute cutting edges (see Plate 16). These flakes are primarily large, thin secondary and primary decortication flakes. Table 9.30 displays metric and edge angle data for these specimens. As can be seen, these flakes are generally "blade-like" in their length to width ratio ($\overline{x}$ = 1.87:1) as opposed to the last category, which are shorter but of about the same width. Thickness is substantially less in this sample. A mean edge angle of approximately 44° indicates a definite cutting function.

Table 9.30
Size data on Thick Steep Edge-Angled Unifaces and
Large, acute-edged, cutting tools from Lamellae 7/6

Thick Steep Unifaces

	(mm) Width	(mm) Length	(mm) Thickness	(gm) Weight	Average Edge Angle, Steep Edge
1·3·19·13	47	50	23	64	64°
5·9·18·1	45	74	25	70	73°
6·7·18·13	47	54	27	87	67°
6·4·18·9	52	75	29	132	75°
7·4·16·1	34	62	14	24	66°
7·4·16·7	45	50	20	46	64°
8·4·15·2	56	59	36	134	66°
9·9·10·9	53	93	27	99	73°
10·5·17·2	57	68	21	95	57°
10·8·19·21	38	55	18	41	61°
11·4·5·10	40	74	15	55	69°
14·5·19·2	56	70	18	61	63°
15·7·19·3	50	70	19	89	73°
15·4·21·3	59	66	25	78	75°, 60°
16·3·15·1	51	67	22	96	63°
$\overline{x}$	48.67mm	65.80mm	22.60mm	78.07gm	66.81°
s	7.35mm	11.39mm	5.78mm	31.28gm	5.64°

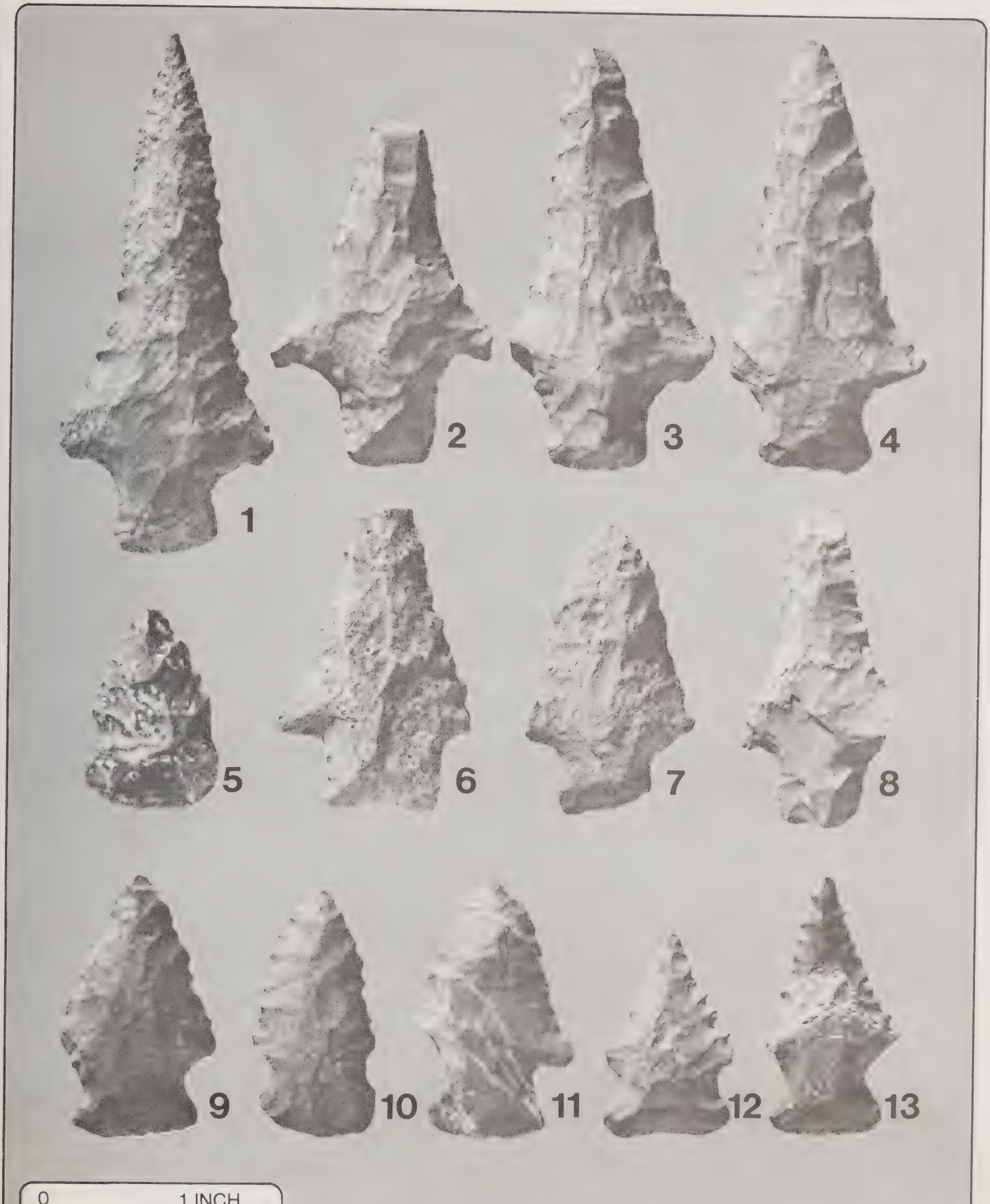
Large, Acute-Edged Cutting Tools

	Width	Length	Thickness	Weight	Average Edge Angle
1· ·19·2	34	74	10	26	55°
1·2·18·5	45	143	12	58	50°, 55°
2·8·18·18	35	82	13	33	55°
4·6·16·1	40	66	17	49	43°
5·3·17·6	29	86	14	32	52°
6·1·18·3	41	88	9	32	40°, 33°
7·5·17·2	47	94	13	64	39°
7·5·16·2	43	116	12	75	53°
7·8·17·3	73	87	22	120	29°, 44°
8·9·16·11	40	91	11	36	34°, 52°
9·3·9·1	43	60	11	35	35°
11·1·5·6	54	85	15	66	42°
11·6·6·29	44	72	10	50	28°
11·6·6·1	50	78	15	49	48°
11·4·5·13	69	69	16	65	49°
12·4·16·14	34	81	15	36	47°
14·9·20·7	61	102	19	123	61°
15·7·18·6	36	94	10	29	55°
15·7·18·5	52	75	9	36	27°
15·1·19·5	67	109	14	102	35°
$\overline{x}$	46.85	87.60	13.35	55.80	44.21°
s	12.45	19.16	3.42	29.38	9.93°

ARTIFACT PROVENIENCES — PLATE 12

KIRK II PROJECTILE POINTS (STRATUM 7/6)

1. 14.1.17.2
2. 13.8.20.1
3. 10.7.18.1
4. 10.5.17.3
5. 4.6.17.1
6. 4.1.18.1
7. 8.9.15.1
8. 9.9.10.8
9. 2.1.20.1
10. 3. .17.17
11. 9.7.10.4
12. 6.8.16.9
13. 8.1.16.2



DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
COMMONWEALTH ASSOCIATES, INC.

PLATE 12
KIRK SERRATED &
STEMMED PROJECTILE POINTS
LAMELLA 7/6 OCCUPATION FLOOR
31CH29-BLOCK A

ARTIFACT PROVENIENCES — PLATE 13

LE CROY PROJECTILE POINTS (STRATUM 7/6)

1. 12.6.16.2
2. 7.8.16.9
3. 12.2.17.6

(STRATUM 5/4)

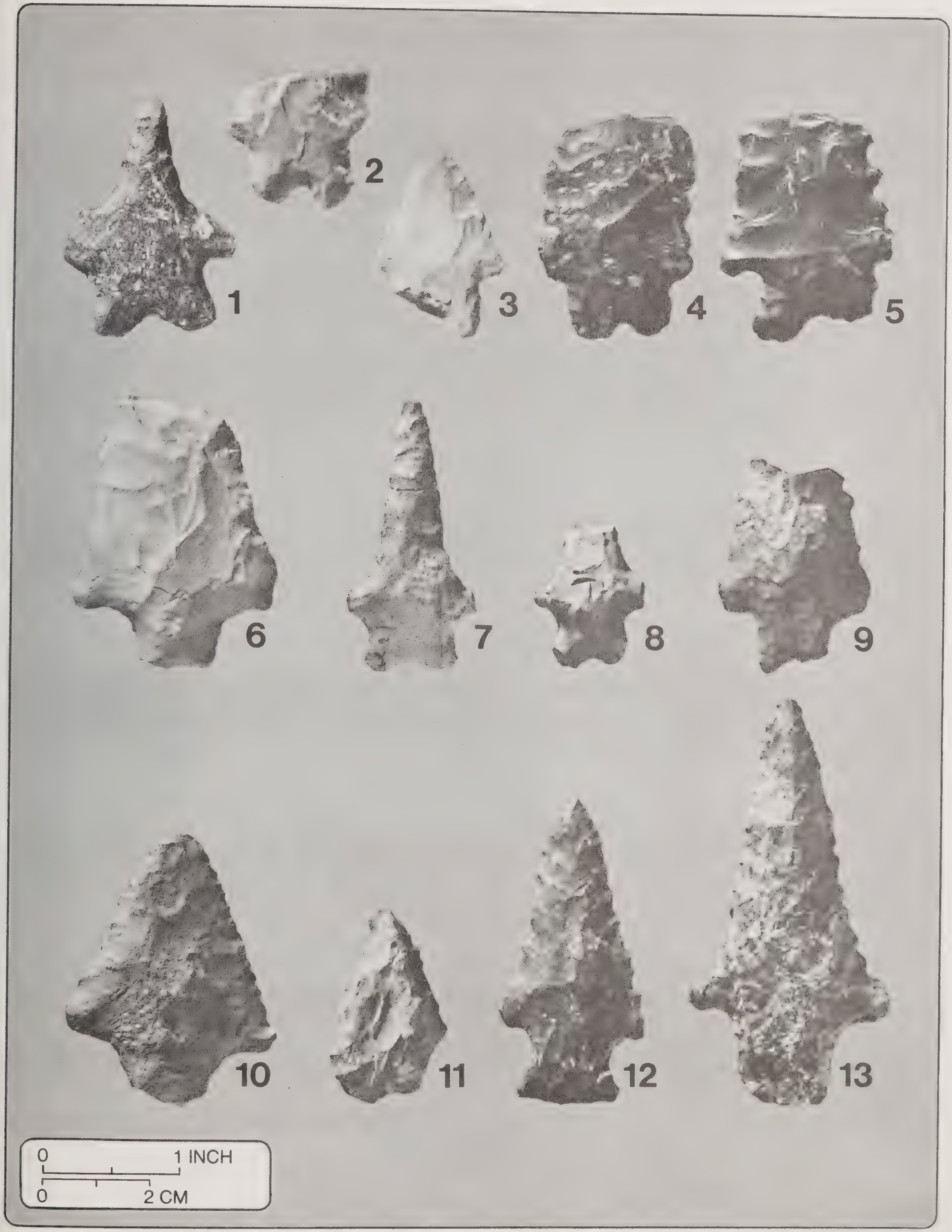
4. 12.6.14.1
5. 1. .14.7

STANLY PROJECTILE POINTS (STRATUM 5/4)

6. 14.2.15.2
7. 4.6.15.2
8. 10.8.4.3
9. 9.3.5.20

KIRK II PROJECTILE POINTS (STRATUM 5/4)

10. 16.3.11.1
11. 12.4.16.13
12. 9. .7.3
13. 7.3.15.2



DATA RECOVERY AT SITES 31CH29 & 31CH8
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CHATHAM COUNTY, NORTH CAROLINA
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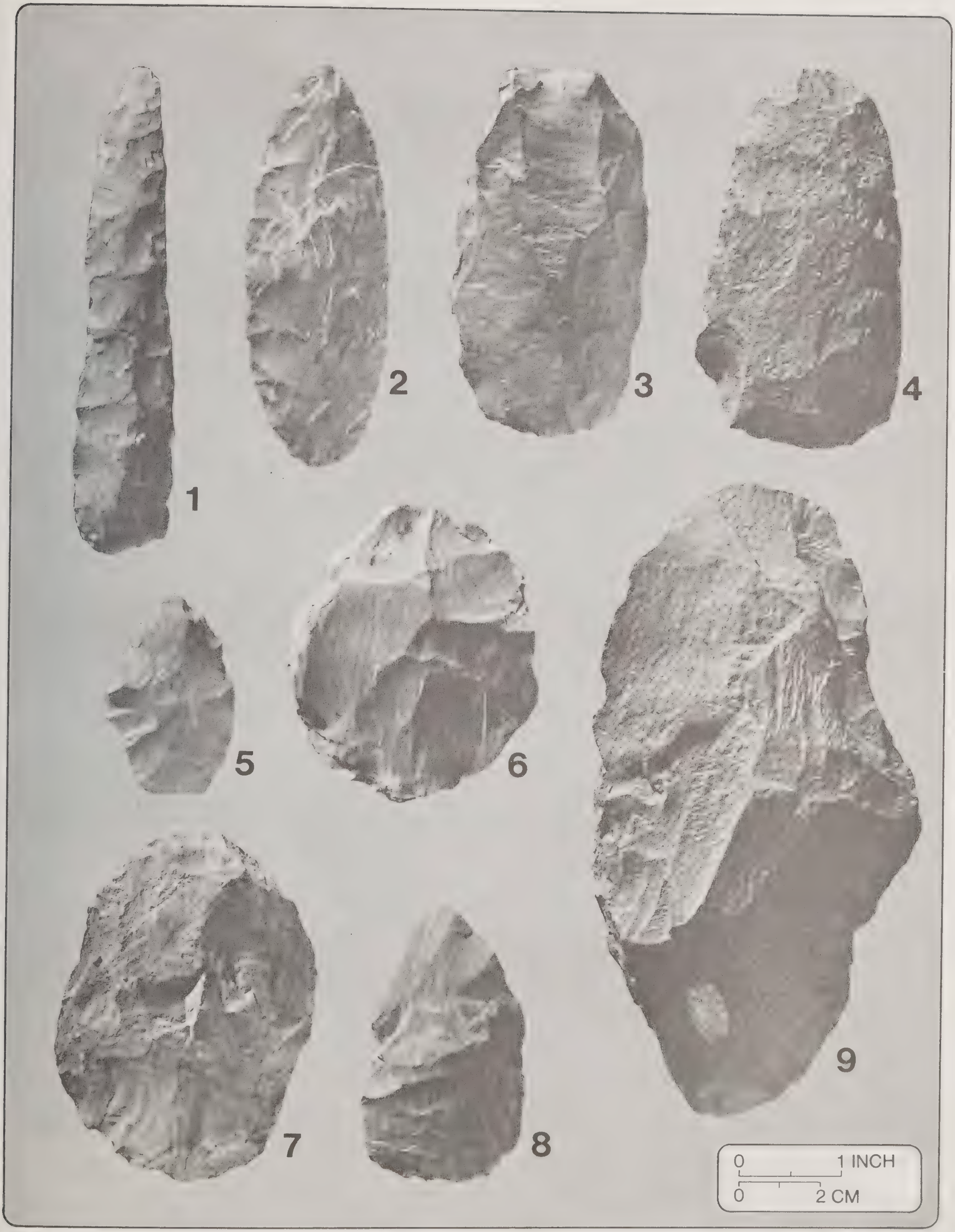
PLATE 13
LECROY, STANLY & MISCELLANEOUS
KIRK PROJECTILE POINTS, LAMELLA
5/4 OCCUPATION FLOOR
31CH29-BLOCK A

ARTIFACT PROVENIENCES – PLATE 14

1. 14.19.1
2. 10.20.1
3. 13.19.3
4. 5.21.2
5. 3.20.5
6. 6.3.20.1
7. 5.21.9
8. 15.21.1
9. 1.21.1



DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
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PLATE 14
BIFACES FROM KIRK, BIFURCATE &
MORROW MOUNTAIN OCCUPATIONS
31CH29-BLOCK A

ARTIFACT PROVENIENCES — PLATE 15

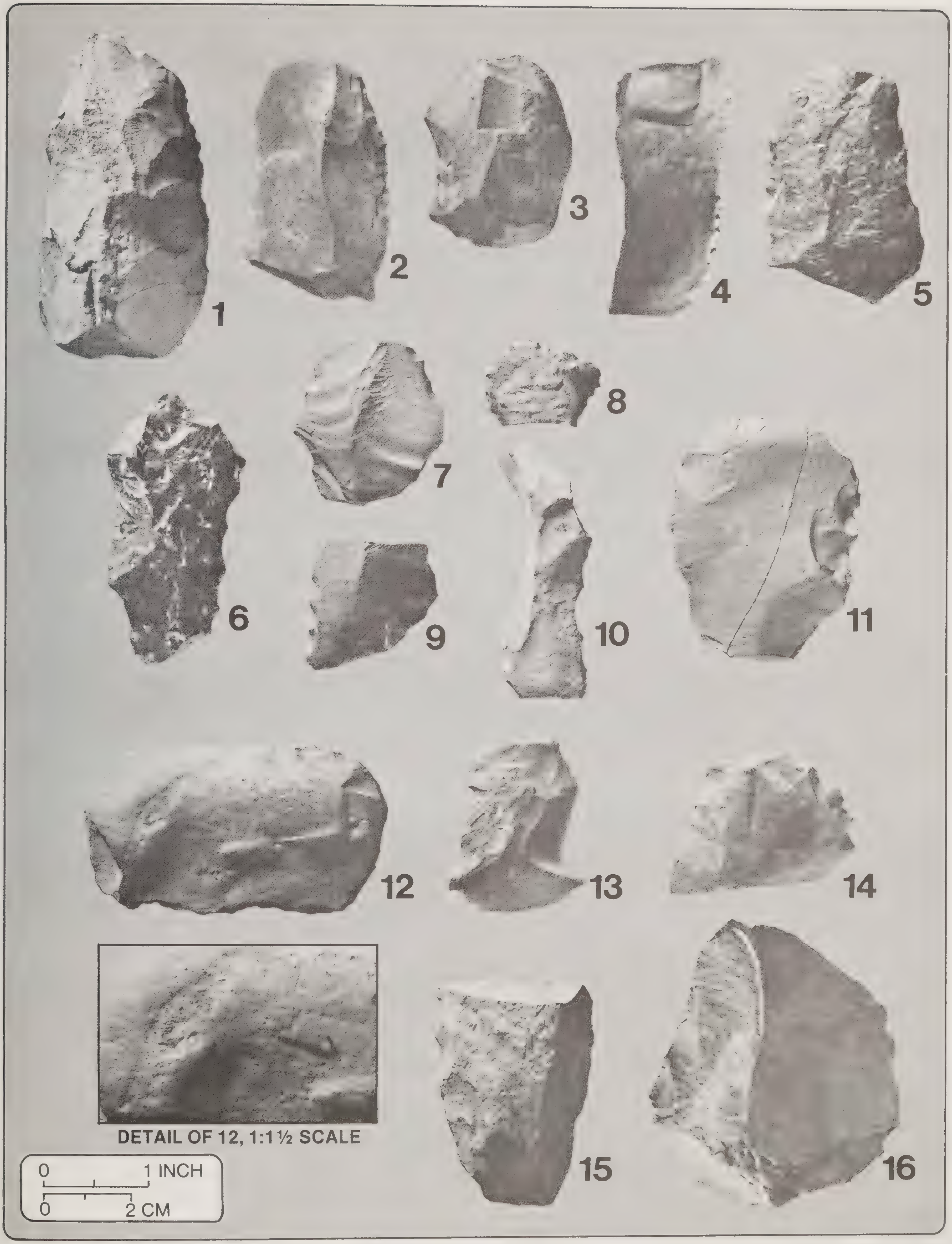
1. 4.4.17.4
2. 15.17.3
3. 15.17.4
4. 6.18.1
5. 6.5.17.3
6. 16.6.15.1
7. 8.4.15.1
8. 11.5.3

DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
COMMONWEALTH ASSOCIATES, INC.

PLATE 15
BIFACES
LAMELLAE 7/6 & 5/4 OCCUPATIONS
31CH29 - BLOCK A

ARTIFACT PROVENIENCES — PLATE 16

1. 8.8.19.1
2. 12.6.19.1
3. 5.2.17.5
4. 12.8.16.20
5. 2.8.19.5
6. 12.1.16.12
7. 2.7.17.3
8. 6.6.17.2
9. 1.6.19.9
10. 6.6.17.1
11. 2.5.19.3
12. 6.1.21.1
13. 2.7.21.4
14. 15.5.20.3
15. 10.8.19.21
16. 15.21.3



DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
COMMONWEALTH ASSOCIATES, INC

PLATE 16
FLAKE TOOLS
LAMELLAE 8 & 7/6 OCCUPATIONS
31CH29-BLOCK A

II. Situational Gear consists of two major classes of artifact: 1) Flake Tools and 2) Miscellaneous Cores.

Flake Tools: This class is comprised of the following tool categories: 1) Endscrapers; 2) Adzes; 3) Thick Unifaces; 4) Large, Acute-angled Flakes; 5) Scalloped-edge Flakes; 6) Denticulate-edged Flakes; 7) Serrate-edged Flakes; 8) Bifacial, Marginally Retouched Tools and 9) Thin Unifacial Tools. Tools, as discussed in Chapter 4, refer to edges, particularly in the more expedient tool categories (Categories 4 and 6 through 9 above). The first three categories describe more definitive tool types and therefore they will be discussed separately from the latter categories.

1) Endscrapers: A total of three whole endscrapers and two bit fragments were recovered from the lamellae 7/6 occupation floor (see Plate 16). As in the past occupation, endscrapers continue to be expediently fashioned. Specimens 5·2·17·5 and 2·8·17·3 correspond to the thick, heavy, irregular variety of the Type II endscraper from the Hardaway Site (Coe 1964:76). Both specimens were manufactured from thick, secondary flakes and were shaped only along the working edge. Specimen 6·2·16·2 was manufactured from a broad, relatively thin flake which was shaped along its entire perimeter. Its form closely resembles the Type III endscraper described by Coe (1964:76) for the Hardaway Site. He observes that this type "constituted the majority scraper type in the Stanly and Morrow Mountain levels at the Doerschuk Site." Specimen 6·8·17·15 is a bit fragment which exhibits a steep, well shaped working edge. It may correspond to the thin, narrow, prismatic flake variety of Type II endscraper discussed, again, by Coe (1964:76). Specimen 3·8·18·22 exhibits almost an entire endscraper bit, resembling a Type III bit (Coe 1964:76). Specimens 6·2·16·2 and 2·8·17·3 were fashioned from white quartz while the other three specimens are made from metavolcanic rock. Measurements for these endscrapers are displayed below.

Specimen No.	Type (Coe 1964:76)	Thickness (mm)	Width (mm)	Length (mm)
5·2·17·5	Type II, Thick	16	36	45
2·8·17·3	Type II, Thick	19	46	39
6·2·16·2	Type III	12	33	70
3·8·18·22	Type III	7		
6·8·17·15	Type II, Thin	9		

2) Adzes: Two examples of adzes, 12·7·16·19 and 2·6·18·4, are associated with this floor. The former specimen constitutes a rather elaborate bit end of a unifacial adz. Its measurements are: maximum thickness = 10mm, maximum width = 33mm, maximum length (incomplete) = 50mm. The left lateral margin has been retouched bifacially along the margin to produce deep serrations. These projections exhibit a moderately intense, lustrous,

Wear and retouch characteristics are quite variable. The most common form of wear is unifacial nibbling which occurred exclusively on 11 of the 23 edges. Denticulate and unifacial retouch each occurred on two edges, bifacial retouch occurred on three edges, edge fracturing occurred exclusively on three edges and bifacial nibbling and serration each occurred on one edge. This would indicate a very heterogeneous group in contrast to the thick unifaces perhaps representing a variety of cross-cutting uses.

5) Scallop-edged Flakes: This tool form (described in the previous section) was most abundantly distributed on the lamellae 7/6 occupation surface. A total of 30 scalloped-edge flakes were recovered (see Plate 16). They are most commonly made on thin, medium to small flakes (Length: $\overline{x}$ = 41.76, s = 11.20; Width: $\overline{x}$ = 30.79, s = 11.19; Thickness: $\overline{x}$ = 7.07, s = 2.96; Weight: $\overline{x}$ = 10.48, s = 7.27). Scalloped edges are only very rarely associated with other edge types on the same flake. In the lamellae 7/6 sample only nine of the 29 flakes containing scalloped edges contain other utilized edges. In eight of these cases, scalloped edges are associated with edges exhibiting only unifacial nibbling or edge fracturing. In the other case a bifacially nibbled edge is associated. One especially complex flake tool (6·9·14·3) contains three different kinds of edge characteristics. The right lateral edge is composed of scalloped area and a bifacially retouched notch near the thick platform bulb of the flake. The distal edge exhibits unifacial wear; the left lateral shows unifacial wear with another bifacially retouched notch near the bulbar end of the flake. No other form of retouch, however, co-occurs with scalloped edges, indicating a highly homogeneous group. In 12 cases, scalloped edges are formed on both lateral edges of the flake while in the other 17 examples only a single scalloped edge is formed. Unifacially nibbled edges generally occur (six out of seven times) with flakes exhibiting only one scalloped edge, since where two scalloped edges co-occur most of the useable edge is modified in that fashion.

6) Denticulate-edged Flakes: A total of seven denticulate-edged flakes occur in the lamellae 7/6 flake tool assemblage, but five of these are subsumed under other categories (see Table 9.31). Specimen 9·4·8·9 contains a denticulated edge and a unifacially retouched edge. Its dimensions are 47mm x 29mm x 13mm. The flake was derived from a biface core and still retains heavy polish along the remnant biface edge and the former core face. Specimen 8·7·15·3 is a side struck flake also derived from a biface core. The lateral edge opposite the platform exhibits a simple denticulated edge. It measures 72mm x 36mm x 12mm.

7) Serrate-edged Flakes: This tool category consists of four specimens (15·3·19·1, 14·8·20·10, 12·8·16·20, and 6·6·17·2) which contain seven serrated edges (see Plate 16). The other three specimens exhibiting serrated edges have been subsumed under previous tool categories. Serration is applied characteristically in a unifacial manner except in Specimen 12·8·16·20. Specimen 6·6·17·2 is interesting because it contains three deeply serrated

Table 9.31 Morphological Characteristics of Flake Tools, Strata 7/6

Stratum 7/6	S.C.	Dent.	Uni.	Ser.	Oth. Bif	Vent. Uni. Nib.	Dors. Uni. Nib.	Alt. Facialwear	Edge Frac.	Bif. Nib.	Tot. Ut./Ret. Edge	Projections	Alt. Ret.	Missing Edges	Flake	Cortex	
1·6·19·9	D-RL V-LL										2			W	CR FBR	3	
1· ·19·2							RL				1			W	BCRF	2	Large Acute
1·2·18·5		LL									1			W	BCRF	1	Large Acute
1·9·18·7			RL			LL RL D					3			P	CR FBR	3	
2·8·17·3			D-D								1			W	Thick FB	3	Endscraper
2·8·18·17						RL					1			P, D, LL	DF	3	
2·8·18·18			LL			LL					1			P	Thick FB	2	Large Acute
2·9·17·8	V-RL D-LL										2			D	FBR	3	
2·5·19·4						RL					1			D	Thick FB	2	
2·6·17·4			D-RL								1			D, P, LL	I	3	
2·6·17·12					RL, LL						2			P	Thick FB	1	
2·6·18·4					LL, D						2			W	CR FBR	2	ADZE
2·7·17·13	D-LL V-RL					RL					2			P	CR FBR	3	
3·8·18·22			D-D								1			P, LL, RL	I	I	Endscraper Bit

	S.C.	Dent.	Uni.	Ser.	Oth. Bif	Vent. Uni. Nib.	Dors. Uni. Nib.	Alt. Facialwear	Edge Frac.	Bif. Nib.	Tot. Ut./Ret. Edge	Projections	Alt. Ret.	Missing Edges	Flake	Cortex	
3·1·18·10	D-LL D-RL						LL				2			W	CR FBR	3	
3·1·17·14									LL, RL		2			W	FBR	2	
3·2·17·12	D-RL D-LL									D-D	3			P	CR FBR	2	
3·2·17·11						LL					1			D, P	FBR	3	
4·6·16·1							RL				1			D	Thick · FB	3	Large Acute
4·4·16·1								LL RL			2			W	DF	3	
(1) 4·4·17·1							LL, RL				2			W	FBR	3	
5·7·17·1					LL						1			P	Thick FB	1	On Biface Edge
5·1·20·3			V-RL		LL						2			W	CR FBR	3	
5·1·18·4	D-LL						RL				2			W	CR FBR	2	
5·2·17·5			D-D								1			W	Thick FB	2	Endscraper
5·8·18·13	DV-LL D-RL										2			W	FBR	3	
5·5·18·6							LL, RL				2			D	CR FBR	2	
5·6·18·11						RL					1			D	FBR	3	
5·9·18·1							LL				1			W	Thick FB	2	Thick Uniface
5·3·17·6					RL		RL				1			W	BCRF	3	Large Acute

	S.C.	Dent.	Uni.	Ser.	Oth. Bif	Vent. Uni. Nib.	Dors. Uni. Nib.	Alt. Facialwear	Edge Frac.	Bif. Nib.	Tot. Ut./Ret. Edge	Projections	Alt. Ret.	Missing Edges	Flake	Cortex	
5·3·17·8							D				1			W	FBR	3	
6·9·17·1	D-LL D-RL						RL				2			D	CR FBR	3	
6·8·17·15			D-D								1			P, LL, RL	I	I	Endscraper Bit
6·8·18·15	D-RL D-LL										2			W	DF	3	
6·7·18·23	D-RL						LL				2			W	FBR	2	
6·6·17·1	D-LL D-RL										2			W	CR FBR	2	
6·5·17·1	D-LL						RL				2			W	FBR	3	
6·5·18·21			D-RL								1			D	Thick FB	3	
6·5·17·2			D-LL								1			W	Thick FB	3	
6·6·17·2				BD-LL BD-D UV-RL							3			W	FBR	2	
6·4·18·9			V-RL								1			W	Thick FB	2	Thick Uniface
6·9·14·3	V-LL						RL D				5	Notch RL, LL		W	PF	3	
6·2·18·22									LL		1			W	FBR	3	
6·2·18·6						LL					1			D	BIP	2	
6·2·18·5	D-RL										1			W	FBR	2	
6·2·18·4									RL		1			W	DF	2	
6·1·18·3									RL		1			W	CR	3	Large Acute

	S.C.	Dent.	Uni.	Ser.	Oth. Bif	Vent. Uni. Nib.	Dors. Uni. Nib.	Alt. Facialwear	Edge Frac.	Bif. Nib.	Tot. Ut./Ret. Edge	Projections	Alt. Ret.	Missing Edges	Flake	Cortex	
6·7·18·13			D-RL								1			W	Thick FB	2	Thick Uniface
7·2·15·6	V-RL										1			W	CR FBR	2	
7·2·17·4							LL				1			D	CR FBR	3	
7·2·17·2			D-LL								1			D	DF	3	
7·2·16·5									RL		1			W	DF	3	
7·1·17·1						LL	P				3	Point LL/P		W	DF	1	
7·6·15·5			UD-LL				RL				2			W	FBR	3	
7·5·16·4			D-RL				LL				2			W	CR FBR	2	
7·5·16·2					RL						1			W	Thick FB	2	Large Acute
7·5·17·2										LL	1			W	Thick FB	2	Large Acute
7·4·16·7			D-LL								1			W	Thick FB	3	Thick Uniface
7·8·17·3				UV-LL							1			W	Thick FB	2	Large Acute
7·4·16·1		D-D	D-LL								3	Point LL/D		W	CR FBR	3	Thick Uniface
8·7·15·3		D-LL									1			W	BCRF	3	
8·4·15·2			D-LL							LL	1			D	Thick FB	3	Thick Uniface
8·2·16·8						LL RL					2			D	CR FBR	3	

	S.C.	Dent.	Uni.	Ser.	Oth. Bif	Vent. Uni. Nib.	Dors. Uni. Nib.	Alt. Facialwear	Edge Frac.	Bif. Nib.	Tot. Ut./Ret. Edge	Projections	Alt. Ret.	Missing Edges	Flake	Cortex	
8·9·17·1			LL								1			D, P	I	2	
8·6·16·9								LL			1			W	DF	2	
8·6·16·10						D	RL, LL				3			W	DF	2	
8·6·16·12			D-D V-LL*								1 1*			P, LL, RL	I	I	Endscraper Bit — Recycled
8·9·16·11							LL, RL				2			W	BCRF	2	Large Acute
9·9·7·6	D-RL										1			W	CR FBR	3	
9·5·8·5			V-D								1			P	FBR	3	
9·4·8·9		D-D	V-LL								2			W	BCRF	2	
9·3·9·91							LL				1			W	BCRF	1	Large Acute
9·2·10·1			V-LL D-RL D-D								3			W	Thick FB	2	
9·9·10·9			V-P							RL	2			W	Thick FB	2	Thick Uniface
10·5·16·2								RL			1			W	DF	3	
10·3·17·1			D-RL							LL	2			W	Thick FB	2	
10·1·17·10									LL, RL		2			D	FBR	3	
10·9·17·17							D		D		1			W	FBR	3	
10·3·17·20							LL				1			W	FBR	2	
10·5·17·2			LL				LL				1			W	Core	2	Thick Uniface

	S.C.	Dent.	Uni.	Ser.	Oth. Bif	Vent. Uni. Nib.	Dors. Uni. Nib.	Alt. Facialwear	Edge Frac.	Bif. Nib.	Tot. Ut./Ret. Edge	Projections	Alt. Ret.	Missing Edges	Flake	Cortex	
10·1·17·13					P, D						2			W	BIP	3	Bipolar Core
10·1·17·11							RL				1			P	FBR	3	
10·5·18·18	V-RL V-LL										2			W	DF	3	
10·6·18·13									D		1			W	DF	3	
10·5·18·12									LL		1			W	CR FBR	2	
10·8·19·21			D-LL								1			D	Thick FB	2	Thick Uniface
10·1·19·14	D-LL										1			D, P, RL	I	3	
10·1·19·4						D, LL					2			P	FBR	2	
10·8·19·20	V-RL										1			W	DF	3	
10·4·19·10			D-LL								1			W	Thick FB	2	
10·6·19·11							LL				1			W	DF	2	
10·5·16·9								RL, LL			2			W	CR FBR	3	
11·4·5·13							RL				1			W	DF	3	Large Acute
11·1·5·8							LL				1			W	CR FBR	2	
11·4·5·10		D-RL									1			P, D, LL	Thick FB	3	Thick Uniface
11·1·5·6									LL		1			W	Thick FB	2	Large Acute
11·6·6·1						D					1			W	Thick FB	3	Large Acute

	S.C.	Dent.	Uni.	Ser.	Oth. Bif	Vent. Uni. Nib.	Dors. Uni. Nib.	Alt. Facialwear	Edge Frac.	Bif. Nib.	Tot. Ut./Ret. Edge	Projections	Alt. Ret.	Missing Edges	Flake	Cortex	
11·6·6·29					UD-RL						1			W	Thick FB	2	Large Acute
12·4·16·14							RL, LL				2			W	Thick FB	2	Large Acute
12·8·16·20				UV-LL			RL				2			D	CR FBR	2	
12·9·16·19				B-LL	D					RL	3			P	I	3	ADZE
12·2·16·12	D-P V-RL					LL					3			W	CR FBR	3	
12·2·17·1			LL								1			P, D, RL	I	3	
12· ·16·18				D-D	LL						2			W	DF	3	
14·2·18·4	D-RL										1			W	CR FBR	3	
Conjoined 14·2·18·6 14·2·18·3	V-LL V-RL										2			W	CR FBR	3	Conjoined
14·2·18·2	D-LL D-RL						D				3			W	FBR	3	
14·5·19·2			D-RL								1			D	Thick FB	3	Thick Uniface
14·5·19·15	D-D								RL, LL		3			P	CR FBR	3	
14·9·20·7			D-RL								1			W	Thick FB	2	Large Acute
14·8·20·6	DV-LL										1			P	Thick FB	3	
14·3·20·17	D-LL						RL, D				3	Notch RL		W	CR FBR	2	

	S.C.	Dent.	Uni.	Ser.	Oth. Bif	Vent. Uni. Nib.	Dors. Uni. Nib.	Alt. Facialwear	Edge Frac.	Bif. Nib.	Tot. Ut./Ret. Edge	Projections	Alt. Ret.	Missing Edges	Flake	Cortex	
14·2·20·4	V-RL										1			W	FBR	2	
14·3·20·18							RL, LL				2			P, D	CR FBR	2	
14·8·20·5						LL	RL				2			W	Thick FB	3	
14·8·20·10				UD-RL			D				2			P, LL	I	3	
14·9·21·3	D-LL										1			W	CR FBR	2	
15·9·17·5			D-LL		RL						2			W	FBR	3	
15·7·18·5		D-D									2		RL	W	CR FBR	2	Large Acute
15·4·18·3						LL					1			W	DF	2	
15·9·18·8							RL				1			W	FBR	3	
15·2·18·16							D		D		1			W	FBR	3	
15·7·18·6									LL		1			D	DF	2	Large Acute
15·1·19·5						RL					1			W	BCRF	3	Large Acute
15·4·21·3			D-D								1			W	Thick FB	3	Thick Uniface
15·7·19·3			V-RL								1			W	Thick FB	2	Thick Uniface
15·3·19·4							LL		LL		1			D	DF	3	
15·1·21·1			D-LL		RL						2			D	DF	2	
16·9·16·1	D-RL										1			D, P, LL	Thick FB	2	
16·3·15·1			D-RL								1			W	Thick FB	2	Thick Uniface

	S.C.	Dent.	Uni.	Ser.	Oth. Bif	Vent. Uni. Nib.	Dors. Uni. Nib.	Alt. Facialwear	Edge Frac.	Bif. Nib.	Tot. Ut./Ret.) Edge	Projections	Alt. Ret.	Missing Edges	Flake	Cortex	
15·3·19·1				UD-LL				RL			2			D	CR FBR	3	
1·3·19·13								RL			1			W	Thick FB	2	Thick Uniface
1·9·19·11							D, RL, LL				3			W	DF	3	
3·6·17·3					LL		RL				2			D	CR FBR	2	
15·2·17·10		D-RL									1			D	FBR	3	

edges. The other three examples contain edges also exhibiting unifacial nibbling. Respectively, the measurements for the flakes are: 50mm x 35mm x 6mm, 35mm x 20mm x 5 mm, 59mm x 27mm x 5mm, and 27mm x 21mm x 2mm.

8) Bifacially Retouched Flakes: thirteen specimens exhibited bifacially retouched margins, but only seven are included in this category. Specimens 2·6·17·12, 3·6·17·3, 5·1·20·3, 5·7·17·1, 15·9·17·5 and 15·1·15-21·1 closely resemble bifaces and could easily be placed in this class, however, the bifacial edges co-occur with unifacial edges exhibiting scraper wear. The specimens range between 6 and 17mm thickness. Specimen 10·1·17·13 is different, however. It represents a minute scalar or bipolar core and measures 16mm x 14mm x 5mm.

9) Thin Unifacial Tools: The remaining 50 flakes exhibit exclusively unifacial retouch or wear (see Plate 16), and represent a general functional category of light cutting and/or scraping tools.

The functional diversity of the flake tool assemblage undergoes one major shift between the lamella 8 and the lamellae 7/6 occupation: scallop-edged flakes increase significantly in their relative importance, primarily at the expense of unifacial tools Unifacial tools continue to decrease in importance. All other categories remain virtually unchanged except combinations which seem to decrease in importance. This gradual trend toward decreased complexity on single specimens is illustrated below.

Unit	Scalloped	Denticulate	Unifacial	Serrated	Bifacial	Combination
Palmer		(2) .04	(39) .76	(4) .08	(4) .08	(2) .04
Lamella 8	(6) .05	(9) .07	(84) .65	(8) .06	(12) .09	(9) .07
Lamellae 7/6	(30) .19	(7) .04	(98) .60	(7) .04	(18) .11	(3) .02

Complexity Element	Palmer	Lamella 8	Lamellae 7/6
Number of edges used per tool	57/34 or 1.68	127/73 or 1.74	208/135 or 1.54
Number of different uses per flake	41/34 or 1.21	94/73 or 1.29	162/135 or 1.20
Number of functional categories	5	10	11

Here both the number of edges used per flake and the number of different uses per flake decrease from the lamella 8 levels. The number of functional categories appears to increase slightly despite the continued simplification of individual flake tools. The difference between lamella 8 and lamellae 7/6 is probably not emphasized. Whereas much of the added functional categories in lamella 8 were derived from rare tool combinations, the increase in the number of categories in the lamellae 7/6 occupation is the result of significant additions to the flake tool assemblage (ie. scallop-edged flakes, thick unifaces and large, acute-angled flakes).

Miscellaneous Cores: This class is subdivided into three categories: 1) Split Quartz Cores; 2) Globular Quartz Core Slugs and Fragments and 3) River Cobbles.

1) Split Quartz Cores: Eleven were recovered from this floor. One popular flake-producing strategy for quartz was to remove flakes from a chunk of material from multiple directions, resulting in globular multi-directional cores. In the late stages of flake production, when cores were too small for effective flake production, they were split to produce thick plano-convex flakes. These split cores could have provided a blank for producing thick unifaces. A fairly tight size range is indicated by nine of these specimens:

Thickness:	$\overline{x}$ = 19.00mm,	s = 2.69mm
Width:	$\overline{x}$ = 37.11mm,	s = 4.86mm
Length:	$\overline{x}$ = 45.56mm,	s = 5.20mm
Weight:	$\overline{x}$ = 39.33qm,	s = 11.35mm

Two larger cores appear to have been split in the same fashion. Specimen 2· ·18·8 is 56mm x 51mm x 30mm and weighs 104 gms. Specimen 12· ·16·16 is even larger, measuring 81mm x 53mm x 33mm and weighs 156 gms (Plate 20).

2) Thirteen Globular Quartz Core Slugs or Fragments were recovered. This category represents quartz globular cores and globular core fragments. These specimens exhibit measurements similar to the split core category but are globular rather than plano-convex. The mean weight for the group is 56.15 gms. with a standard deviation of 26.29 gms.

3) Four river cobbles of meta-igneous rock were recovered which were of suitable knapping material and thus considered to be potential raw material sources. Specimens 11· ·5·5 and 3· ·17·2 exhibit heavy battering. Specimens 9· ·17·1 and 5· ·19·1 are virtually unaltered except for single spalls removed from the ends.

III. Site Furniture consists of three cobble tools, Specimen 12·8·16·17 is a large quartzite *pitted cobble* or *anvil stone* (see Plate 19). One face is heavily pitted over the entire area while the other face is only slightly battered in the center. One possible use for this anvil may have been to split the quartz globular cores discussed previously. Also it has been suggested earlier that anvils may have functional in the production of bone grease and juice. The pitted cobble measures 132mm x 108mm x 63mm and it weighs 1.27 kilograms.

The second object is a circular cobble tool with battering evidenced along the entire edge perimeter (see Plate 19). One face may have been used a a grinding stone. It is made of a dense metavolcanic rock. It weighs 255 grams and is 76mm x 77mm x 44mm. This form is similar to the Type V Hammerstone described by Coe (1964:79): "Hammerstones of this type were round and, frequently, were completely spherical in shape. Most of these specimens were made of greenstone or quartz, and they were abraded over their whole surface."

The final object is a *grinding stone* fragment (Specimen 9·5·9·6). Both faces are heavily ground and the edge appears to have been shaped by pecking. The projected form is subrectangular. It also is made of a meta-volcanic stone. The fragment weighs 239 grams and is 62mm x 57mm x 50mm.

Lamellae 5/4 Occupation Floor: Stanly/Morrow Mountain

Like the previous floor, artifactual material associated with lamellae 5 and 4 could not be effectively separated. For purposes of analysis, therefore, these two surfaces are combined. Two phases are represented based on projectile point styles. These are the Stanly and the Morrow Mountain phases. Chapman (1977:163-164) reports C14 dates of 5840±215B.C. (G x 4123) and 5860±175B.C. (G x 4121) associated with the Stanly stratum (D) at Icehouse Bottom. Coe (1964:35) recognizes a developmental link between the Kirk Stemmed/serrated cluster and the Stanly stemmed projectile point in the North Carolina Piedmont.

By contrast, Chapman (1977:54, 125) perceives a developmental link between the Stanly cluster and the bifurcate tradition. As indicated earlier, the relationship between the Kirk and Bifurcate Traditions is geographically complex and not well understood. Therefore, the origins of the Stanly phase are likewise unclear.

The Morrow Mountain phase at Icehouse Bottom is associated with a radiocarbon date of 5045±245 B.C., Gx4124 (Chapman 1977:164-165). This date derives from Stratum B where "37 Morrow Mountain I type projectile points" were recovered. Chapman (1977: 165) notes that this date is slightly older than dates obtained for this phase at Russell Cave (Griffin 1974:13), Stucks Bluff (DeJarnette et al. 1975:113) in Alabama, and site 40CF107 in the Normandy Reservoir in Tennessee, dated between 4500 and 4000 B.C. These later dates coincide with Coe's (1964:123) temporal placement of the phase, but it is possible that the Morrow Mountain stemmed style spanned the entire fifth millennium B.C.

Coe (1964:37-39, 43) distinguished two projectile point styles within this phase: Morrow Mountain I stemmed and Morrow Mountain II stemmed. The stratigraphic relationship between the two types was unclear at the Doerschuk site where only 16 specimens of the latter form were recovered (Coe 1964:43). Both types occurred in Zones IX and VII which were separated by a period of major flood deposition (Coe 1964: 34). The continuation of the Morrow Mountain II stemmed type into Zones VI and V at Doerschuk "may have been the result of intrusive disturbances or it may indicate that this form was transitional and survived to a later date. Evidence from other sites in the area supports the latter interpretation" (Coe 1964:43). Excavated data from 31Ch8 (see this chapter) lends added support to this suggestion. The association of the two types in subsequent occupations in Zones IX and VIII suggests, however, that neither type was stratigraphically superior in the initial Morrow Mountain phase occupations at the Doerschuk site.

Coe (1964:122) viewed the Morrow Mountain phase as a western intrusion into the Piedmont with its origins in an early Desert Culture phase typified by the Gypsum Cave projectile point type. He saw very little to suggest that the Morrow Mountain type constituted a link between the earlier Stanly stemmed type and the later Savannah River Stemmed type as he states (1964:54):

> Following the abandonment of this site and the deposition of the flood sands that formed Zone X, the Doerschuk site was reoccupied by people with a different cultural orientation. The projectile points were quite different in style and appeared to be completely unrelated to the styles of the earlier occupations.

However, he acknowledges no other significant differences between the Stanly and Morrow Mountain artifactual inventories (Coe 1964:54). Chapman (1977:54) is undecided about the relationship between the Stanly and Morrow Mountain types but states that:

> The relationship of the fourth component, the Morrow Mountain in Stratum B (Icehouse Bottom), to the preceding Stanly component is unknown. The bases of the Morrow Mountain type points may be viewed as vestigial stems. Categories 6 and 7 are associated with the Morrow Mountain type points and probably represent the continuance of the stemmed point tradition.

Information from the analysis of the Haw River projectile point types supports Chapman's position since a clear trend toward contracting stems can be demonstrated beginning with the Kirk Stemmed/serrated types, continuing in the slightly contracting stems of the Stanly Cluster and culminating with the extreme stem contraction which characterizes the Morrow Mountain cluster.

I. *Personal Gear* consists of projectile points and bifaces.

Projectile Points:

1) *Stanly Cluster:* A total of eight whole or fragmental projectile points from the lamellae 5/4 occupation (see Plate 13) correspond to the Stanly Cluster as described by Chapman (1977:31-35 and 54). These specimens are all very similar morphologically to the Stanly Stemmed type described by Coe (1964:35-36) and Chapman's (1977:32, 35) Category 15, Medium, Straight to Expanded Stem, Notched Base. Specimens 4·7·15·2 and 10·8·4·3 represent Stanly drills (see Coe 1964:37). The latter specimen was refit with a blade tip (6·8·10·2).

Coe (1964:35) has provided a detailed type description, while Chapman (1977:35) provides a similar, if less elaborate, description for the Category 15 projectile points at

Icehouse Bottom. Two major differences are apparent, however. First, Chapman describes the blade outline as "broad with straight to excurvate edges." Examination of Figure 31 in *Formative Cultures of the Carolina Piedmont* (Coe 1964:36) indicates that the wider blades of his Stanly Stemmed type also exhibit straight to recurvate edges. This suggests that blade curvature is a function of life-history stage, beginning with excurvate to straight outlines and progressing toward increasing incurvature caused by continued use and resharpening. Chapman's (1977:32) photographs of Category 15 (Figure 15) suggest a similar blade life-history. The logical conclusion to this practice are forms identified as Stanly drills (see Coe 1964:37). Given this understanding, Chapman's (1977:32 and 34) Category 13, which exhibits excurvate edges but otherwise appears to resemble the morphology of Category 15 closely, may simply reflect an earlier stage discard of a single type.

The other major difference is in size. The sample Coe (1964:35) described from the Hardaway site averages 55mm in axial length and 35mm in shoulder width compared to means of 41mm and 27.3mm respectively for the Icehouse Bottom Category 15 sample (Chapman 1977:35). The lamellae 5/4 sample from the Haw River excavation is intermediate with a mean axial length of 49mm and a mean shoulder width of 30mm (see Table 9.32). Such differences are probably related to stochastic variance in small samples and differences in raw material rather than to stylistic variability. This latter difference is especially important in the case of the Little Tennessee River Valley sample where small nodules of ridge and valley chert were commonly used.

The Haw sample consists of two specimens (10·8·4·3 and 4·6·15·2) which correspond to Coe's (1964:37) description of the Stanly drill, five specimens (14·2·15·4, 14·5·16·6, 16·3·11·2, 9·3·5·20 and 6·9·15·5) similar to the Stanly Stemmed type (see Coe 1964:35) and one basal fragment (2· ·16·1). The blade of specimen 10·8·4·3 has been transversely broken, while the other drill is whole and exhibits a light polish over a small stepped, distal fracture at the tip suggestive of drill use. Both of these specimens exhibit lateral reduction of the shoulders which results in a slight decrease in the mean width dimensions of the shoulder in Table 9.32. The three Stanly Stemmed points all exhibit varying degrees of blade damage. Specimens 9·3·5·20, 14·5·16·6 and 14·2·15·4 exhibit large transverse blade breaks while specimens 6·9·15·5 and 16·3·11·1 show small distal fractures at the tips. The distal ends of specimens 14·2·15·4 and 16·3·11·2 have been reworked to restore the cutting edge. Haft damage consists primarily of basal ear fractures. Specimens 16·2·11·2 and 14·2·15·4 are missing both ears while 9·3·5·20 has one ear missing. Specimen 6·9·15·5 exhibits a transverse fracture of the tang which removed all of the base.

2) *Morrow Mountain Stemmed:* The principal style of Morrow Mountain projectile points from the Haw River excavations is the type II (see Coe 1964:37, 39, 43). Of the 17 Morrow Mountain Stemmed points recovered from the lamellae 5/4 floor, only two could be classes as type I; there does not appear to be a clear stratigraphic separation between the two types. Coe (1964:35-43) also failed to discriminate these types strati-

graphically at the Doerschuk site. His most emphatic statement on their relationship proclaimed that type II continued in use after type I had disappeared from the sequence. Chapman (1977:33) recovered only two type II points from Icehouse Bottom where his sample of Morrow Mountain Stemmed is predominantly type I. He comments (1977:33):

> Unfortunately the sample size of Category 9 [Morrow Mountain II Stemmed] is inadequate to shed light on the relationship of Morrow Mountain II to Morrow Mountain I types, or the types' relationship to other stemmed types such as Category II [a short contracted stemmed variant which Chapman suggests may be transitional between the Stanly Cluster and the Morrow Mountain types].

It is of interest to note that the Morrow Mountain II stemmed type is associated with the Stratum B at Icehouse Bottom which contains the most abundant concentration of the Morrow Mountain I type (37) while four other type I points occur in the higher strata.

Thus, in all three excavations a clear stratigraphic separation of the types has not been demonstrated. In fact, the data presented more strongly suggest that the types co-occur. One possible alternative explanation for the morphological variability described by Coe as typological, is that type I is actually an early stage version of type II. The variability, then, could be explained as a result of life-history changes.

From Coe's (1964:37) description type I exhibits many characteristics of an early stage projectile point. First, the blade outline is predominantly excurvate. Serration, a late stage characteristic of blade reduction as discussed earlier, is very faint when present on this type and the mode of manufacture is said to be crude. Other evidence which would suggest continuous rather than typological variability is contained in Coe's statement about the smaller examples of type I. As opposed to the larger specimens, these smaller points were finished by pressure flaking and were much more symmetrical. The type II blade, by contrast, is narrow with predominantly straight to incurvate outline as reflected in the discussion under "Form" (Coe 1964:37). Although the shoulder is described as wide, the average width amounts to only two-thirds of the type I shoulder width. This could indicate lateral shortening due to resharpening rather than to a typological distinction. The short blade observed on some of the type II specimens is also an indication of late stage axial shortening due to resharpening or repair. Examination of the photographs (figures 33 and 34 in Coe 1964:38-39) of two types indicates that the type II point is more carefully manufactured and finished. Many of the type I points appear to be "preform-like."

Chapman's (1977:30-33) descriptions of the two types coincide closely with the life-history argument as well. He characterizes the type I blades as predominantly "broad with straight or excurvate edges" and the shoulders are also described as "broad." The type II blades are narrower and appear to be recurvate in outline, also a moderate to late stage characteristic.

The Haw River sample can be used to further illustrate differences which appear to relate to life-history rather than typological distinctions. Both type I examples (12·6·14·2 and 9·4·6·10) exhibit excurvate blade outlines and could be considered "crude" in their manufacture (see Plate 17). The only measurable tip angle (12·6·14·2) is 75°, also indicative of an early life-history stage. This contrasts sharply with a mean of 49.22° for the type II examples. Blade outlines for the type II examples also indicate later life-history stages: seven incurvate, six straight and one excurvate or recurvate. Serration can be seen on three type II points, but is absent from both type I's. Axial shortening is also present on six of the 14 definite type II points. All of these lines of evidence would suggest that the variability described by Coe is not typological, but rather, related to life-history stage. Without any evidence to suggest that these types have stratigraphic significance, therefore, we urge that this distinction be discontinued and that these types be combined to form a single type: The Morrow Mountain Stemmed type.

The relationship between the Stanly Cluster and the Morrow Mountain Stemmed type constitutes another major question. Here, Coe and Chapman would appear to disagree. Coe (1964:54) hypothesizes that the Morrow Mountain occupation represented a cultural discontinuity in the Piedmont, constituting a break in the earlier Corner-notched/stemmed tradition which reappears with the Savannah River occupation. Chapman (1977:54) views the Morrow Mountain Stemmed type as "a continuance of the stemmed point tradition." He further identifies one type variant, Category 11, which he contends may represent a transition from this earlier tradition and the Morrow Mountain types (Chapman 1977:34). What is obvious from Chapman's photographs (Chapman 1977: Figures 14 and 15) is that the Stanly Cluster examples show a consistent tendency toward stem contraction. Measurements taken on all of the Stanly Cluster projectile points pictured produces a mean tang width to base width ratio of 110.45 with a standard deviation of 9.01 (n = 22). This compares well with the 109.67 mean obtained for the Haw River Stanly Cluster from lamellae 5/4 (see Table 9.32).

Other metric dimensions also indicate that the Morrow Mountain Stemmed type does not represent a radical departure from the Stanly Stemmed type. Table 9.33 demonstrates that the only significant changes in the basic measurements are related to decreases in base width and blade length. The rest of the basic design remains unchanged. More significant changes occur between the Small Kirk Corner-notched and Kirk Stemmed/serrated types or between Palmer I and Palmer II points. Other changes of significance relate to blade treatment. Morrow Mountain stemmed points are discarded at an extremely low, mean edge angle of 52.61° (see Table 9.32), considerably lower than all previous types except Palmer Corner-notched. Blade curvature at discard shifts from extremely incurvate in the Kirk Stemmed type, to variably incurvate and occasionally straight for the Stanly Cluster to straight to only slightly incurvate in the Morrow Mountain Stemmed type.

Table 9.32
Summary Statistics on Stanly and Morrow Mountain Stemmed types from Lamellae 5/4 occupation

	Stanly Stemmed			Morrow Mountain Stemmed		
	n	$\overline{x}$	s	n	$\overline{x}$	s
Thickness	8	9.38	1.60	17	7.88	2.45
Base Width	6	14.17	1.47	15	7.40	2.59
Tang Width	8	15.75	2.25	17	15.71	2.80
Shoulder Width	7	30.00	6.81	15	25.87	4.81
Blade Width 2	6	17.33	6.09	13	16.85	4.45
Axial Length	2	46.67	4.04	6	36.00	5.02
Tang Length	6	11.67	1.51	15	13.87	3.78
Blade Length	3	34.43	5.03	7	26.57	10.81
Notch Length	6	14.17	3.43			
Edge Angle	36	60.17°	14.83	81	52.61°	11.91
Tang Width to Base Width Ratio	6	109.67	16.67	15	228.80	61.81
Blade Width 2 to Shoulder Width Ratio*	5	48.60	12.70	12	66.25	10.27

* Significant Difference

Table 9.33
Students' t-test comparing the Stanly Stemmed and
Morrow Mountain Stemmed samples from
Lamellae 5/4 occupation

Occupation 5/4: Stanly Stemmed vs. Morrow Mountain

	t-value	Probability
Thickness	1.5158	.10 > P > .05
Base Width	5.7320	.0005 > P*
Tang Width	0.0339	P > .10
Shoulder Width	1.5569	.10 > P > .05
Blade Width 2	0.1830	P > .10
Axial Length		
Tang Length	1.3822	.10 > P > .05
Blade Length	2.9858	.025 > P > .01*
Notch Length		
Edge Angle	2.9305	.005 > P > .0005*
Tang Width to Base Width Ratio	4.6538	.005 > P > .0005*
Blade Width 2 to Shoulder Width Ratio	2.8212	.01 > P > .005*

* Significant Difference

3) Unidentified Stemmed: Specimen 16·6·13-15·2 is a small, straight base, stemmed projectile point which could not be identified as to a cultural-historical type. It may represent a Stanly Cluster variant (Chapman 1977:32, 34) similar to Category 14. Its metric dimensions are: Thickness = 6mm; Base Width = 15mm; Tang Width = 14mm; Shoulder Width = 24mm; Blade Width 2 = 15mm; Axial Length = 29mm; Tang Length = 10mm; Blade Length = 19mm; $\overline{x}$ Edge Angle = 55°.

4) Drill: Specimen 10·6·5·3 is a square based, hafted biface resembling a drill. Chapman (1977:77) recovered a similar drill from an Upper Kirk Stratum at Icehouse Bottom. Coe (1964) does not picture a comparable drill type with an unshouldered haft element. The tip does not exhibit wear. Fresh resharpening scars along the blade edge which contrasts with the patinated texture of the haft suggests that this tool was scavenged from an earlier occupation and re-used. Its metric measurements are: Thickness = 9mm; Base Width = 19mm; Shoulder Width = 22mm; Axial Length = 82mm; Tang Length = 18mm; Blade Length = 64mm; and $\overline{x}$ Edge Angle = 71°.

5) Miscellaneous Fragments from the Lamellae 5/4 occupation consist of seven small distal tips, two transversely broken blade tips, six Morrow Mountain Stemmed basal tips or ears and one unidentified haft midsection. The distal tips (12·5·15·7, 5·8·16·4, 2· ·15·3, 8·4·9-15·1, 13·3·18·1, 2· ·14·2 and 16·2·16·3) exhibit sharp points, acute tip angles ($\overline{x}$ = 44.43°, s = 12.67°) and the latter specimen contains sharp serrations. The transverse blade tips (12·7·15·4 and 1·4·13·2) also exhibit sharp tips and late life-history stage tip angles of 37° and 55° respectively. Specimen 12·7·15·4 is 55mm long and 20mm wide and specimen 1·4·13·2 is 27mm long and 22mm wide. The Morrow Mountain stemmed basal ears all exhibit rounded ends and blunted, step fractured lateral edges.

Bifaces: A total of 49 whole and/or fragmental bifaces representing 47 individual bifaces were recovered from the lamellae 5/4 occupation floor. Of these eight are classed as biface/discoid cores and 39 are classed as a combined intermediate/immediate manufacture category. Utilization (see Table 9.34) is lower in the former category with a 62 percent utilization rate compared with 92 percent for the combined category.

The utilization patterns are identical to those described for the lamellae 7/6 occupation. The pervasive wear pattern is entire perimeter polish. In addition, seven bifaces (see Table 9.34) exhibit heavy end polish indicative of an axing function and six bifaces exhibit scraper edges (indicated by "unifacial fracture" in Table 9.34) as discussed previously (see Plate 14).

II. Situational Gear consists of two major classes: 1) Flake Tools and 2) Miscellaneous Cores.

Table 9.34
Data on Bifaces from Lamellae 5/4 Occupation Floor

Biface Category	Condition	Shape	(mm) Width	(mm) Length	(mm) Thickness	Height Index	Edge Polish	(gms) Weight
Biface/Discoid Core								
5·9·15·9	Fragment	Ovate			28	.87		
8·7·12·1	End	Ovate/	53		19	.36	X	
9·7·5·4	End	Irregular			17	.71		
9·4·6·13	End Missing	Ovate/	45		22	1.00	X	
11·1·3·7	End	Ovate/	51		21	.31	X	
12·3·15·3	End Missing	/Ovate	58		24	.85		
5·7·16·1	End	/Ovate			22	.83	Heavy End Polish X	
10·8·2·1	Whole	Ovate/Ovate	48	100	16	.15	Heavy End Polish Unifacial Fracture X	

Biface Category	Condition	Shape	(mm) Width	(mm) Length	(mm) Thickness	Height Index	Edge Polish	(gms) Weight
$\overline{x}$			51.0		21.13	.64		
s			4.95		3.87	.32	62%	
Combined								
1·9·14·8	Whole	Ovate/Ovate	41	62	10	1.00	X	28
1·9·14·9	End	Ovate/	44		10	1.00	X	
1·9·15·3	Fragment	Irregular			10	1.00	X	
2·9·16·2	Fragment	Irregular			9	.13	Unifacial Fracture X	
3·7·16·5	Whole	Ovate/Subrectangular	40	75	19	.58	Heavy End Polish X	51
3·2·17·8	Lateral	Ovate/			9	.80	X	
4·7·16·9	Midsection	Lanceolate/			9	.50	X	
4·7·16·8	Fragment	Ovate/			8	.60	X	

Biface Category	Condition	Shape	(mm) Width	(mm) Length	(mm) Thickness	Height Index	Edge Polish	(gms) Weight
5·5·16·8	End	/Ovate	30		9	.50	Heavy End Polish Fracture X	
5·5·15·3	End Missing	/Ovate	29	68	13	.86	Heavy End Polish X	
6·9·15·4	End	/Subrectangular	35		16	.60	Heavy End Polish X	
6·1·15·1	End	Ovate/			14	.75		
6·3·14·1	Tip Missing	Truncated/Ovate		17	6	1.00	X	
6·5·14·7	End	Ovate/	41		12	1.00	X	
6·4·15·6	Whole	Ovate/Ovate	35	66	12	.50	Unifacial Fracture X	28
9·7·6·1	Fragment	Irregular	45		13	.86	X	
Conjoined 9· ·6·7								
9·6·8·6	Whole	Ovate/Ovate	34	82	8	.63	X	41

Biface Category	Condition	Shape	(mm) Width	(mm) Length	(mm) Thickness	Height Index	Edge Polish	(gms) Weight
9·7·5·12	End	Ovate/			8	.33	X	
9·4·7·2	End	Ovate/	44		10	.67		
9·1·5·1	End	Ovate/	45		10	1.00	Unifacial Fracture X	
9·4·5·7	Fragment	Ovate			14	.56	X	
9·6·6·3	End	Ovate			7	.40	Quartz	
9·2·5·21	Lateral				6	1.00		
9·8·6·20	End	Ovate/			6	1.00	X	
9·3·5·1	Midsection				8	1.00	X	
11·1·5·1	End	Ovate/			12	.71	X	
11·3·4·4	Whole	Ovate/Subrectangular	37	51	8	.60	Unifacial Fracture X	27
11·1·4·6	Fragment				9	.80	Quartz	
11·1·5·2	Whole	Truncated/Ovate	40	54	11	.57	X	30

Biface Category	Condition	Shape	(mm) Width	(mm) Length	(mm) Thickness	Height Index	Edge Polish	(gms) Weight
12·2·14·3	Whole	Ovate/Ovate	43	61	16	.78	Unifacial Fracture X	35
Conjoined 12·5·15·7								
12· ·14·4	Whole	Irregular	39	52	10	.25	X	36
13·1·19·3	Whole	Ovate/Ovate	32	45	12	.71	X	15
14·2·17·2	Whole	Irregular	51	80	19	.27	X	75
15·2·15·2	Lateral	Ovate			13	.86	X	
15· ·15·7	End Missing	Ovate/Truncated	35		13	.86	X	
16·5·15·1	End	/Subrectangular	38		12	.33	X	
16·1·16·1	End Missing	Ovate/	40		11	.83	X	
16·2·16·4	Whole	Ovate/Ovate	48	62	14	.40	X	36
16·9·14·1	End Missing	Ovate/	36		16	.60	Unifacial Fracture X	
$\overline{x}$			39.22	59.62	11.31	.69	92%	36.55
s			5.60	17.01	3.39	.25		15.67

Flake Tools from the Lamellae 5/4 occupation floor are composed of nine categories: 1) Endscrapers, 2) Adzes, 3) Thick Unifaces, 4) Large, Acute-angled Flakes, , 5) Scallop-edged Flakes, 6) Serrate-edged Flakes, 7) Denticulate-edged Flakes, 8) Marginally Retouched Bifacial Tools and 9) Thin Unifacial Flakes.

1) Endscrapers: Only one endscraper was distinguished from the lamellae 5/4 assemblage. Specimen 10·3·16·5 corresponds morphologically to the Type II endscraper that Coe (1964:76) describes from the Hardaway Site. The specimen is made from a thick, irregular secondary flake that is shaped along the right lateral margin and steeply retouched along the distal working edge. Its dimensions are 68mm x 40mm x 19mm. The mean edge angle for the bit is 65°. The unifacially retouched lateral edge is sharp and sinuous. Its edge angle is also 65° and a slight polish occurs on the prominences of the medial aspect of the edge. The bit edge exhibits moderate step fracturing and a light polish occurs extending onto the dorsal surface.

2) Adzes: Specimen 9·7·5·5 is a relatively thick flake derived from a biface core. Unifacial nibbling occurs along the proximal and both lateral edges. The distal edge appears to have received damage in the form of moderately large, conchoidal impact fractures. The edge is straight and sinuous. Polish occurs on the medial aspect of this edge and extends onto the ventral surface of the flake. The wear pattern is suggestive of an adz.

3) Thick Steep-edged Unifaces: This category is composed of 14 specimens (identified as "Thick Unifaces" on Table 9.35). This group is identical in its wear characteristics to the thick unifaces in the lamellae 7/6 occupation. Again, a heavy wood-working activity is suggested such as scraping or planing. Summary statistics on the dimensions and edge angles for this category are listed below:

Width:	$\overline{x}$ = 38.92mm, s = 10.14mm
Length:	$\overline{x}$ = 58.15 mm, s = 14.57mm
Thickness:	$\overline{x}$ = 17.77mm, s = 4.73mm
Weight:	$\overline{x}$ = 51.54mm, s = 22.94mm
Edge Angle:	$\overline{x}$ = 75.22°, s = 8.42°

Specimen 10·9·5·3 dimensions were so much larger (95 x 72 x 36mm, 250gms.) than the other specimens that it was omitted from the summary statistic calculations.

Specimens 9·2·5·22, 1· ·14·5 and 5· ·16·2 deserve special mention. They are made of quartz and resemble a steep-edged uniface type specifically made of quartz. Goodyear (1978) suggests that this hemispherical form characterizes Early Archaic (i.e., Palmer) assemblages in South Carolina. The three examples discussed here, however, derive from an Early to Middle Archaic transitional context.

4) Large, Acute-Angled Flakes: This category consists of seven specimens (identified as "Large Acute" on Table 9.35) from this occupation (see Plate 15). These tools were made from large, broad flakes, generally exhibiting partial cortex on the dorsal face and the striking platform. The utilized edges were unretouched and exhibit unifacial nibbling. Specimen 16·6·15·1 also exhibits a moderate polish along the medial aspect of the utilized edge. The metric dimensions and edge angles for this class are summarized below:

Width:	$\bar{x}$ = 52.28mm, s = 8.44mm
Length:	$\bar{x}$ = 75.43mm, s = 12.54mm
Thickness:	$\bar{x}$ = 19.0mm, s = 6.08mm
Weight:	$\bar{x}$ = 68.29mm, s = 35.67mm
Edge Angle:	$\bar{x}$ = 52.44°, s = 9.87°

5) Scallop-edged Flakes: This tool category diminishes in frequency between the lamellae 7/6 occupation and this floor. Only four specimens (see Table 9.35) were recovered as compared to 30 in the previous occupation. Similar tools were reported from Icehouse Bottom (Chapman 1977:Figure 25, and 85). They are grouped under a general category of denticulates, but figure 25f illustrates an unmistakable scallop-edged tool. Eight of the ten denticulates at Icehouse Bottom were recovered from Early Archaic contexts, while only two were found in the Middle Archaic strata. This may parallel the noticeable decrease in the scallop-edged tools at the Haw River sites.

It was considered appropriate to distinguish between the scallop-edged flakes and the other denticulate-edged tools, though, was considered appropriate because of the radically different wear patterns manifested on the two forms. The scallop-edged tools exhibit very little fracture wear, while the denticulate-edged tools characteristically are damaged by step fracturing from use.

The metric and edge angle data for the scallop-edged tools are listed below:

Width:	$\bar{x}$ = 22.00mm, s = 8.76mm
Length:	$\bar{x}$ = 40.00mm, s = 13.34mm
Thickness:	$\bar{x}$ = 5.50mm, s = 2.65mm
Weight:	$\bar{x}$ = 6.75gm, s = 6.18gm
(Projection) Edge Angle:	$\bar{x}$ = 82.29°, s = 7.50°
(Inter-projection) Edge Angle:	$\bar{x}$ = 87.75°, s = 9.27°

As the size data indicate, these tools are made on relatively thin, elongated flakes. Examination of the platform characteristics of these flakes also indicates that they were derived from biface cores.

Two of the specimens (5·3·14·4 and 10·9·1·6) from this occupation also contain acute edges (mean of 40° and 35° respectively) exhibiting fine unifacial and bifacial nibbling. When other functional edges were associated with scallop-edges in the previous occupation (lamellae 7/6), acute unifacially and bifacially nibbled edges were the predominant type as well. Such nibbling is very suggestive of light cutting uses (see Tringham et al. 1977), perhaps for a task which commonly required the light shredding performed by a scallop-edge. Fish processing might be a possible use.

6) Serrate-edged Tools: Only one specimen (16·9·13-15·4) exhibits a serrated edge. The retouch was applied unifacially to a small biface thinning flake (34 x 21 x 3mm; 2 gms). The platform of the flake exhibits heavy use polish indicating that the parent core from which it was derived also was used as a tool. Both lateral edges exhibit serration with mean edge angles of 50° and 58°.

7) Denticulate-edged Flakes: A total of ten denticulate-edged tools (referred to as Denticulate on Table 9.35) were identified from the lamellae 5/4 occupation. The wear patterns along these edges are identical with the samples from previous occupations. The teeth exhibit varying degrees of rounding and the concavities exhibit moderate to heavy edge fracturing. Polish does not appear to characterize the edges. The metric dimensions and edge angle data are summarized below:

Width:	$\overline{x}$ = 38.27mm, s = 9.86mm
Length:	$\overline{x}$ = 47.00mm, s = 13.09mm
Thickness:	$\overline{x}$ = 11.55mm, s = 4.46mm
Weight:	$\overline{x}$ = 26.45gm, s = 14.40gm
Edge Angle of Teeth:	$\overline{x}$ = 64.44°, s = 10.19°
Edge Angle of Concavities:	$\overline{x}$ = 74.12°, s = 10.02°

Comparing this information to the scallop-edged flakes indicates that denticulate edges are made of considerably thicker and large flakes. Also, denticulate retouch produces a notably more acute edge angle than scallop retouch. The characteristics of the denticulate-edged flakes would suggest a heavy duty use, possibly sawing or scraping. The unifacial character of wear would suggest a one-way use motion.

In only two of the ten cases did flakes with denticulate edges exhibit additional types of edges. Specimen 10·2·1·1 exhibits a point formed by the intersection of the denticulate edge with a unifacially retouched cortical edge. Specimen 9·7·5·3 also contains an acute (42°) lateral edge exhibiting bifacial wear nibbling and light polish indicative of a cutting function.

8) Marginally Retouched Bifacial Tools: Five specimens (6·5·15·7, 5·3·15·10, 10·5·3·4, 14·6·17·1 and 16·3·14·15) exhibit bifacial retouch along their lateral margins. These tools probably represent expediently fashioned tools which are functionally similar

Table 9.35 Morphological Characteristics of Flake Tools, Stratum 5/4

Stratum 5/4	Sc.	Dent.	Uni.	Ser.	Oth. Bif.	V – Uni. Nib.	D – Uni. Nib.	Alt. Wear	Frac.	Bif. Nib.	Tot.	Proj.	Alt. Ret.	Missing	Flake	Cortex	
1· ·14·5			D-D								1			W	Thick FB	3	Thick Uniface
1·3·14·4			D-LL				RL				2			W	BCRF	3	
2·4·15·1							RL		RL		1			W	CR FBR	3	
(6) 2·8·16·16			D-RL D-LL								3	Point RL/LL		P	I	1	
3·6·15·1							RL	D		LL	3			W	FBR	3	
3·6·16·3							LL				1			W	Thick FB	2	Large Acute
3·2·17·8							LL RL				2			W	CR FBR	2	Large Acute
3·9·16·2							RL, LL		RL, LL		2			D	DF	3	
4·6·16·1		V-LL								RL	2			D	FBR	3	Denticulate
4·1·15·8		D-RL									1			W	Thick FB	3	Denticulate
4·4·15·6			D-RL								1			LL	Thick FB	3	Thick Uniface
4·5·15·4						LL	RL				2			W	FBR	3	
4·9·15·1							RL				1			W	DF	2	Large Acute
4·6·15·13			D-RL						RL		1			D, P, LL	I	3	
5·3·14·4	D-RL D-LL						RL				2			W	FBR	3	Scallop
5·4·15·1							D				1			W	DF	2	
5·4·16·6			D-P				P				1			W	Thick FB	3	Thick Uniface

Stratum 5/4	Sc.	Dent.	Uni.	Ser.	Oth. Bif.	V – Uni. Nib.	D – Uni. Nib.	Alt. Wear	Frac.	Bif. Nib.	Tot.	Proj.	Alt. Ret.	Missing	Flake	Cortex	
5·5·15·4							RL			LL	2			W	FBR	2	
5·3·15·10					RL LL						2			W	FBR	3	Bifacial
5· ·16·2			D-D D-RL								2			W	Thick FB	3	Thick Uniface
6·9·14·1						RL	LL				2			D	Thick FB	3	Thick Uniface
6·5·15·8			V-RL V-LL			D					3			W	Thick FB	3	Thick Uniface
6·5·15·7			RL		LL					RL LL	2		LL	W	BCRF	3	Bifacial
6·5·16·3		D-RL									1			D, P	Thick FB	3	Denticulate
6·9·16·7	D-RL D-LL										2			W	CR FBR	2	Scallop
8·7·11·1		D-RL									1			W	BCRF	2	Denticulate
9·2·5·22			D-LL								1			W	Thick FB	2	Thick Uniface
9·7·5·3		D-LL					P, RL				3			W	FBR	3	Denticulate
9·8·5·4		D-LL									1			W	BCRF	3	Denticulate
9·6·5·5					D		RL			LL	3			W	FBR	2	Adze
9·2·5·20										LL	1			W	BCRF	2	
9·7·6·5							LL				1			W	FBR	3	
9·2·6·12			V-LL			LL	RL				2			W	Thick FB	3	Thick Uniface
9·4·8·10							D, LL				2			W	FBR	2	
10·9·5·3			D-D D-P				RL				3			W	Thick FB	2	Thick Uniface

Stratum 5/4	Sc.	Dent.	Uni.	Ser.	Oth. Bif.	V – Uni. Nib.	D – Uni. Nib.	Alt. Wear	Frac.	Bif. Nib.	Tot.	Proj.	Alt. Ret.	Missing	Flake	Cortex	
10·2·1·1		LL					D				3	Point D/LL		W	FBR	2	Denticulate
10·9·1·6	D-RL									LL	2			W	FBR	3	Scallop
10·7·2·4						RL LL	D				4	Point D/RL		W	FBR	3	
10·8·2·2							RL				1			W	FBR	2	
10·9·3·10						D, RL	LL				3			W	FBR	3	
10·4·3·2							LL				1			W	CR FBR	3	
10·1·4·4						RL					1			W	FBR	2	
10·9·4·9							RL				1			P, D	FBR	3	
10·5·3·6										LL	1			P	Thick FB	3	
10·5·3·4					LL		RL				2			W	BCRF	3	Bifacial
10·5·3·6										RL	1			W	IND	3	Large Acute
10·4·3·3							RL				1			W	DF	2	
10·5·4·6								LL			1			W	FBR	3	
10·3·5·5							LL	RL			2			W	FBR	3	
10·6·16·12			D-LL								2			D	CR FBR	2	
10·3·16·5			V-RL D-D								2			W	Thick FB	2	Endscraper
11·8·4·1							LL				1			W	Thick FB	2	
11·2·4·5			D-D								1			W	Thick FB	1	Thick Uniface
12·5·14·7			D-P								1			W	Thick FB	3	Thick Uniface
13·6·18·1							LL				1			W	BCRF	2	Large Acute

Stratum 5/4	Sc.	Dent.	Uni.	Ser.	Oth. Bif.	V – Uni. Nib.	D – Uni. Nib.	Alt. Wear	Frac.	Bif. Nib.	Tot.	Proj.	Alt. Ret.	Missing	Flake	Cortex	
14·1·16·4							D				1			W	DF	3	
14·2·16·9			D-LL								1			W	BCRF	2	Thick Uniface
14·9·16·2		D-LL									1			W	Thick FB	1	Denticulate
14·6·17·1					LL						1			W	BCRF	3	Bifacial
15·6·15·8			D-D								1			W	Thick FB	3	Thick Uniface
15·6·15·1							LL, RL				2			W	BCRF	3	Large Acute
16·6·15·4				V-LL		D				RL	3			W	FBR	3	
16·6·15·3	D-LL										1			W	FBR	2	Scallop
16·3·14·15			LL (Plat)		RL						2			W	BCRF	2	Bifacial
16·4·15·10							LL				1			P, D, RL	I	3	
16·9·14·2		D-LL									1			P	I	1	Denticulate
10·2·5·3							LL				1			W	Thick FB	2	
10·2·5·2							LL RL				2			W	Thick FB	3	Thick Uniface
11·2·4·8						P					1			LL	BCRF	3	Large Acute
10·6·3·1		Alt-RL									1			W	BCRF	2	Denticulate
11·4·3·4		D-RL D-LL									2			P	I	1	Denticulate

to bifaces. The edges exhibit light polish on their medial aspects, again similar to biface wear. Metric and edge angle data are presented below:

Width:	$\overline{x}$ = 33.20mm, s = 3.11mm
Length:	$\overline{x}$ = 62.40mm, s = 27.30mm
Thickness:	$\overline{x}$ = 11.00mm, s = 1.58mm
Weight:	$\overline{x}$ = 24.00gm, s = 5.10gm
Edge Angle:	$\overline{x}$ = 56.42°, s = 7.28°

9) Thin Unifacial Flake Tools: The remaining 28 tools exhibit unifacial nibble wear or retouch on acute edges. Some of these specimens also exhibit light bifacial nibbling, but these were all lumped into this category based on their probable cutting uses. Retouch occurs on only four tools in this category. Metric and edge angle data are presented below:

Width:	$\overline{x}$ = 34.08mm, s = 9.11mm, n = 25
Length:	$\overline{x}$ = 49.96mm, s = 10.40mm, n = 23
Thickness:	$\overline{x}$ = 8.30mm, s = 3.42mm, n = 27
Weight:	$\overline{x}$ = 15.84gm, s = 8.93 gm, n = 25
Edge Angle:	$\overline{x}$ = 47.59°, s = 14.65°, n = 81

Below are comparisons which indicate that the differences between the flake tool assemblages of lamellae 7/6 and 5/4 are only minor. The most notable changes relate to the decrease in importance of scallop-edged and serrated tools in lamellae 5/4 and the increased use of denticulate-edges. Relative to the rest of the assemblage, denticulate edge tools undergo a dramatic increase in importance during the lamellae 5/4 occupation over all previous occupations. Flake tool complexity remains relatively unchanged although there appears to be a slight increase in the average number of utilized edges on a flake. The functional diversity of the assemblage remains fairly constant as well.

Occupation	**Scalloped**	**Denticulate**	**Unifacial**	**Serrated**	**Bifacial**	**Combination**
Lamellae 7/6	(30) .19	(7) .04	(98) .60	(7) .04	(18) .11	(3) .02
Lamellae 5/4	(4) .06	(11) .15	(47) .65	(1) .01	(6) .08	(3) .04

Complexity Element	**Lamellae 7/6**	**Lamellae 5/4**
Number edges used per flake	205/134 or 1.53	117/72 or 1.63
Number different kinds of edges per flake	159/134 or 1.19	84/72 or 1.17
Number of functional categories	11	10

Miscellaneous Cores: This class of artifacts can be grouped into four categories: 1) Split Quartz Cores, 2) Quartz Core Slugs and Fragments, 3) Expedient Cores and 4) Unmodified Cores.

1) Split Cores: Eight split quartz cores were recovered. These artifacts represent the same core reduction strategy as described for the lamellae 7/6 split core sample. Metric dimensions are summarized below:

Thickness:	$\bar{x}$ = 19.25mm, s = 2.05mm, n = 8
Width:	$\bar{x}$ = 33.50mm, s = 5.17mm, n = 6
Length:	$\bar{x}$ = 28.60mm, s = 15.19mm, n =5
Weight:	$\bar{x}$ = 26.20gm, s = 11.97gm, n = 5

2) Quartz Core Slugs and Fragments: Fourteen artifacts of this category were recovered (refer to lamellae 7/6 discussion). The mean weight for the group is 46.07gm with a standard deviation of 18.88gm.

3) Expedient Cores: A total of five large pieces of material exhibiting uni- and bi-directional flake scar patterns were recovered. These cores represent an alternative flake producing strategy. This type of core never constitutes a major artifact category in any of the areas excavated. The individual metric dimensions of these artifacts are listed below:

1) 6·9·14·11:	91 x 57 x 50mm, 319 gms
2) 11·5·4·2:	70 x 34 x 33mm, 109gms
3) 10· ·5·1:	54 x 48 x 45mm, 149gms
4) 4· ·15·3:	71 x 44 x 30mm, 97gms
5) 9·8·5·6:	76 x 54 x 28mm, 106 gms

All are produced from locally occurring raw material in the form of river cobbles, veins or boulders. Specimen 9·8·5·6 is quartz while the others consist of metavolcanic rock.

Specimen 6·9·14·11 (see Plate 20) indicates the approximate size of flakes produced from this type of core. The widths of four visible scars average 44.75mm and the only observable length was 70mm. Flakes were removed from both axes of the core. One observable platform was flat and completely covered with cortex. The other platforms were faceted and non-cortical. At the end opposite the cortical platform a bifacial edge was produced which exhibits use polish along its medial aspect. Specimen 10· ·5·1 exhibits a flat, non-cortical platform with three flake scars originating from it. Two of these scars are blade-like measuring 20mm and 22mm wide and 36mm and 53mm long. The other scar is obscured. Flakes removed from such platforms would be flat and, characteristically, have a denticulated-appearing outline along the dorsal edge of the platform.

4) Unmodified Cores: One river cobble, 14· ·16·8, made of suitably knappable metavolcanic rock (180mm x 40mm x 29mm, 375 gms) and one blocky piece of opalized chalcedony (126mm x 56mm x 47mm, 430 gms) were recovered from this floor as well. Neither exhibited evidence of alteration, although both appear suitable as raw material for tool production.

III. Site Furniture consists of one end-battered hammerstone and a raw material cache, Feature 22.

End-Battered Hammerstone: Specimen 9·6·5·3 represents a quartzite cobble (100mm x 60mm x 51mm, 438 gms) which exhibits heavy battering at both poles and less intense battering in areas along the face directly adjacent to the polar areas (see Plate 19). The central portions of the face are unaltered. The wear would suggest that the cobble was used as a hard hammer for flint knapping. The polar wear would indicate blows delivered to a core where the direction of force is exactly perpendicular to a platform, while the facial battering would indicate an oblique angle. This is suggestive of the differences between block core (expedient cores) flake production and bifacial reduction and flake production respectively. Both types of core are present in the occupation area of lamellae 5/4.

Raw Material Cache (Feature 22): A cache composed of 19 bifaces, 133 flake blanks, one large biface/discoid core and one large anvil stone was recovered from the lamellae 5/4 occupation (see Plate 18). The contents of the cache were neatly placed in a small depression measuring 55cm x 27cm x 26mm. The large biface core was placed on top of the smaller bifaces and blanks and then an even larger anvil stone was placed over the top, effectively covering the contents of the cache. The cache remained apparently undisturbed after its initial formation.

Over 97 percent of the bifaces and blanks were made of a green latite felsite (Raw Material C) which corresponds exactly to the raw material composition of the large biface core (12·1·14·3). The other four biface specimens were manufactured from latite porphyry, Raw Material A, (12·1·15-16·20, 12·1·15-16·102, and 12·1·15-16·129), and one blank was of andesitic felsite, Raw Material B (12·1·15-16·133).

The platform morphologies of the blanks indicate that they were produced from a biface core. Eighty-six of the 113 observable platforms on the blanks and bifaces of the cache exhibit platforms either oblique or parallel to their long axes. The platforms are bifacially faceted, as well, indicating a morphology consistent with the side-struck flake of bifacial core reduction described earlier. The remaining 27 flakes contain platforms which are perpendicular to their long axes, but the faceted, sinuous nature of the platforms indicates that those flakes were also removed from a biface core.

The size of flakes produced from this biface core strategy is fairly consistent. The metric data on the bifaces and blanks from the cache are:

	n	(mm) $\bar{x}$	(mm) s	n	(mm) $\bar{x}$	(mm) s
Length	19	78.11	16.31	102	65.37	16.10
Width	19	44.84	4.46	102	39.79	9.33
Thickness	19	11.74	1.91	130	9.45	2.45

The values for the two classes are similar, but blanks used in biface manufacture are larger.

Data on whole scar size from the large biface core (204mm x 103mm x 43mm, 1kg) is complementary to the above values (see Table 9.36). The variance is greater, but the general size parameters are apparent. Elongated flakes are predominantly removed from biface cores with the long dimension parallel to the striking platform producing characteristic "side-struck" flakes.

Table 9.36
Data on whole scar size, large biface core, Feature 22

Scar	Length	Width
1	105mm	60mm
2	100mm	31mm
3	46mm	30mm
4	70mm	34mm
5	103mm	48mm
6	70mm	27mm
7	97mm	33mm
8	53mm	37mm
9	87mm	61mm
$\overline{x}$	81.22mm	22.55mm
s	39.55mm	13.70mm

Other platform orientations are also possible, but are less frequent and result from either irregularities in the reduction sequence or from specialized flake production which requires platform preparation. The presence of the large anvil stone suggests that some of the flake production may have resulted from a block on block or anvil technique (see Crabtree 1972:34). In this case the core would have been slammed against the anvil to produce flake fractures.

Evidence of utilization on all 19 bifaces and 16 of the blanks indicates that other tasks were performed with the cache contents before the site was abandoned. The blanks exhibit unifacial nibbling and light polish while the bifaces show the kind of edge perimeter polish which characterizes all of the biface assemblages discussed so far. It is interesting to note in this context that the same perimeter polish is also extant on the edges of the biface core (12·1·15-16·3), particularly on the edge of one end which exhibits both heavy polish and large, conchoidal impact fracture scars. The edge has been worn straight, indicating some type of chopping function. Whether a tool this size was hafted or not is at present unclear. However, Semenov (1964:125) reports that hafted bifacial axes from Novgorad-Seversk, U.S.S.R., attained weights of up to 8 kg., which is eight times the weight of the specimen in question.

ARTIFACT PROVENIENCES – PLATE 17

MORROW MOUNTAIN PROJECTILE POINTS (STRATUM 5/4)

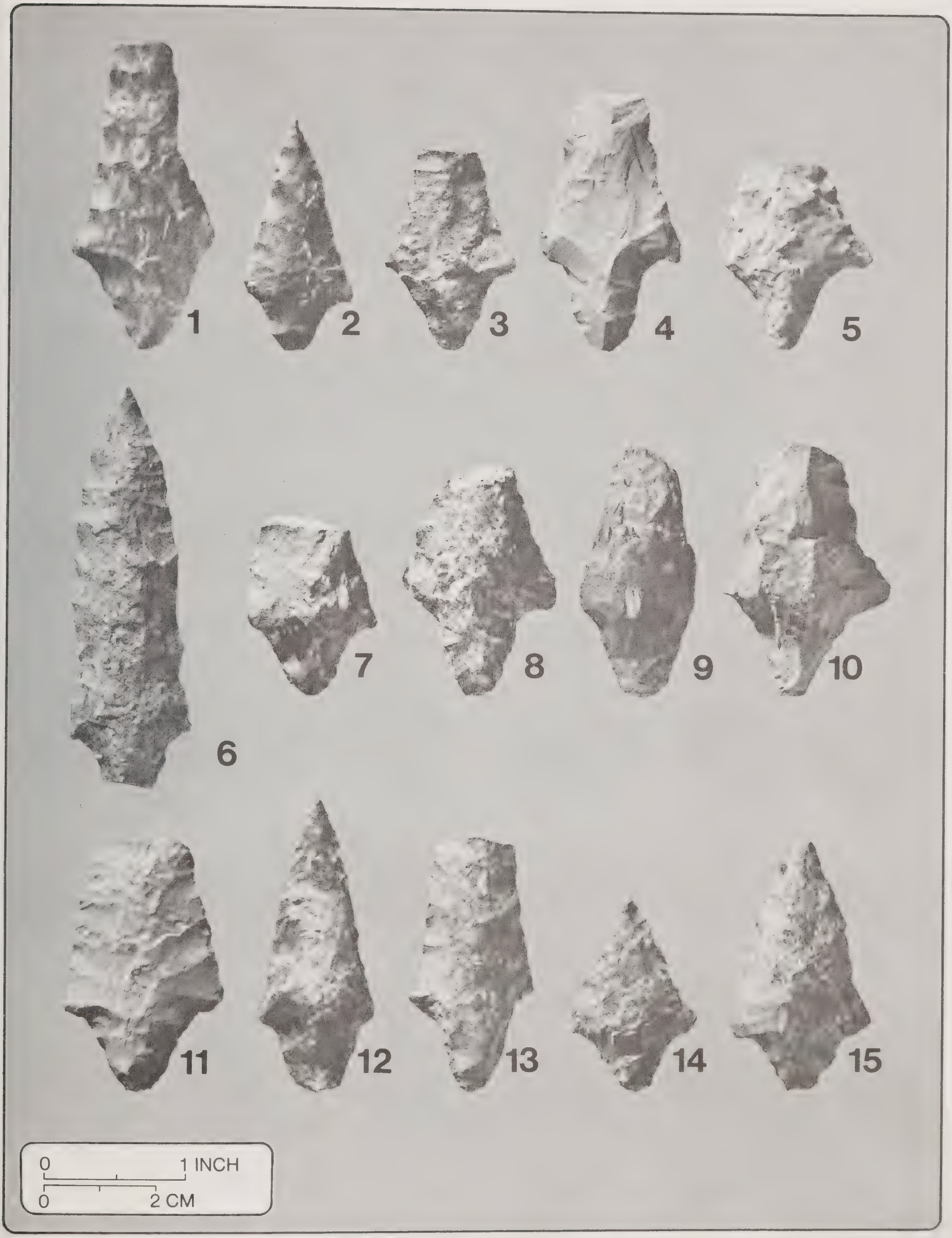
1. 13.5.19.2
2. 10.2.5.1
3. 1.4.14.3
4. 1.2.13.1
5. 5.5.16.9

(STRATUM 3)

6. 9.8.3.9
7. 6.5.12.10
8. 6.8.12.6
9. 16.5.12.1
10. 9.4.4.8

(STRATUM 2)

11. 14.1.13.2
12. 14.9.13.1
13. 13.6.14.1
14. 16.4.12.1
15. 13.1.14.1



DATA RECOVERY AT SITES 31CH29 & 31CH8
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PLATE 17
MORROW MT. PROJECTILE POINTS
LAMELLAE 5/4, 3 & 2 OCCUPATIONS
31CH29 - BLOCK A

ARTIFACT PROVENIENCES — PLATE 18

1. Feature 22, Flake Blank
2. Feature 22, Flake Blank
3. Feature 22, No. 23, Ventral Surface of Flake Blank
4. Feature 22, Biface
5. Feature 22, Biface
6. Feature 22, No. 6, Ventral Surface of Flake Blank
7. Feature 22, No. 6, Dorsal Surface of Flake Blank
8. Feature 22, No. 70, Ventral Surface of Flake Blank
9. Feature 22, No. 70, Dorsal Surface of Flake Blank
10. Feature 22, No. 23, Dorsal Surface of Flake Blank
11. Feature 22, No. 152, Ventral Surface of Flake Blank
12. Feature 22, No. 152, Dorsal Surface of Flake Blank
13. Feature 22, No. 82, Ventral Surface of Flake Blank
14. Feature 22, No. 82, Dorsal Surface of Flake Blank
15. Feature 22, No. 91, Dorsal Surface of Flake Blank
16. Feature 22, No. 91, Ventral Surface of Flake Blank
17. Feature 22, No. 1, Large Biface Core

DATA RECOVERY AT SITES 31CH29 & 31CH8
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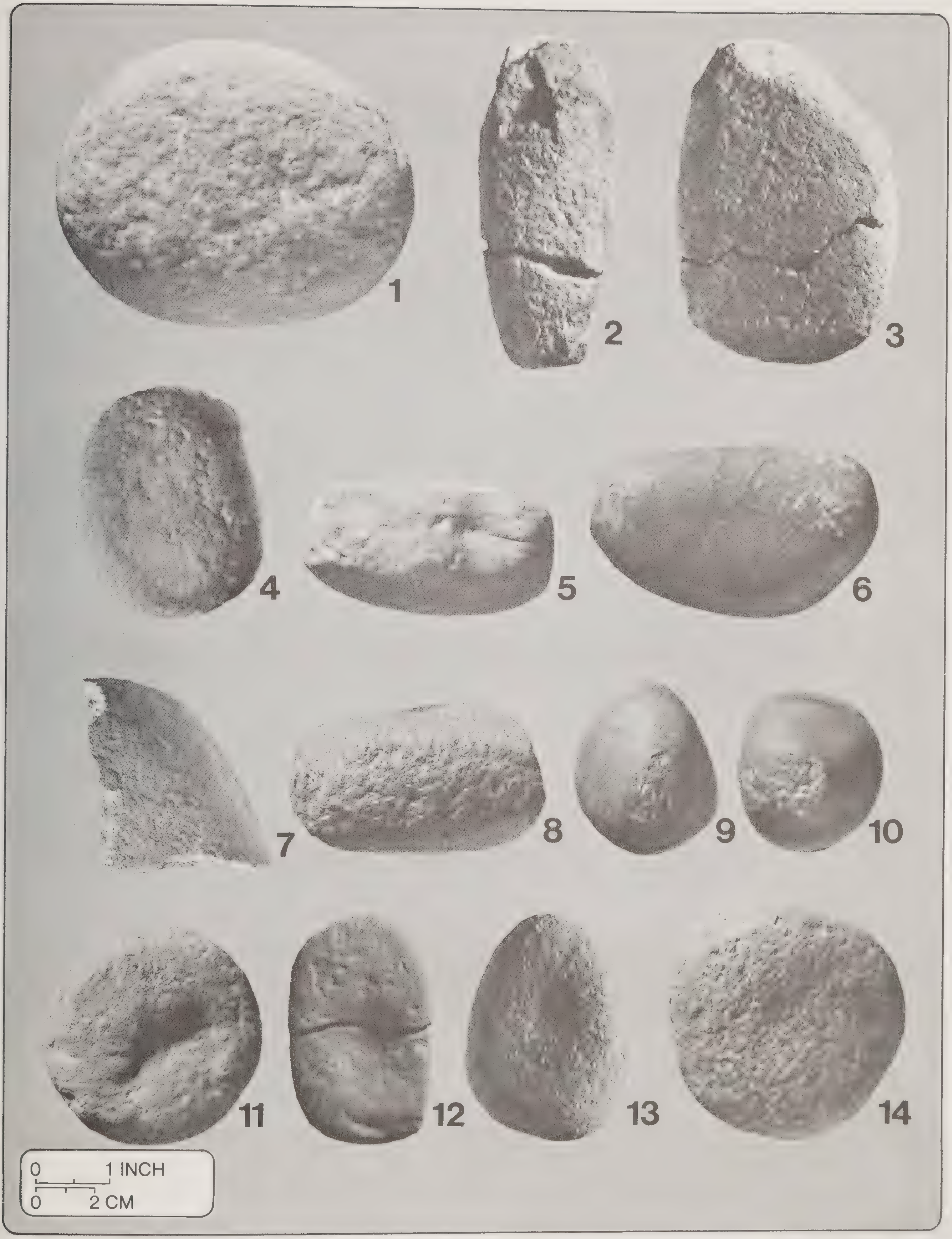
PLATE 18
CONTENTS OF TOOL CACHE,
FEATURE 22
31CH29-BLOCK A

ARTIFACT PROVENIENCES — PLATE 19

1. Top view of Pitted Cobble, 12.8.16.17, 31Ch29
2. Side view of Crinding Stone, Feature 33, 5.6.14.1, 31Ch29
3. Top view of Grinding Stone, Feature 33, 5.6.14.1, 31Ch29
4. Top view of Pitted Cobble with Edge Abrasion, 14.3.28.1, 31Ch29
5. Side view of Pitted Cobble, showing Edge Abrasion, 14.3.28.1, 31Ch29
6. Top view of Elongated Hammerstone, 9.6.5.3, 31Ch29
7. Top view of Grinding Stone Fragment, 9.5.9.6, 31Ch29
8. Side view of Grinding Stone Fragment, 9.5.9.6, 31Ch29
9. End view of Elongated Hammerstone, showing End Battering, 9.6.5.3, 31Ch29
10. End view of Elongated Hammerstone, showing End Battering, 9.6.5.3, 31Ch29
11. Top view of Hammerstone or Grinding Stone, 2.1.17.14, 31Ch29
12. Top view of Pitted Cobble, 5.9.1.15, Block C, 31Ch8
13. Top view of Pitted Cobble, 1.3.4.5, Block C, 31Ch8
14. Top view of Pitted Cobble, 7.3.1.2, Block C, 31Ch8



DATA RECOVERY AT SITES 31CH29 & 31CH8
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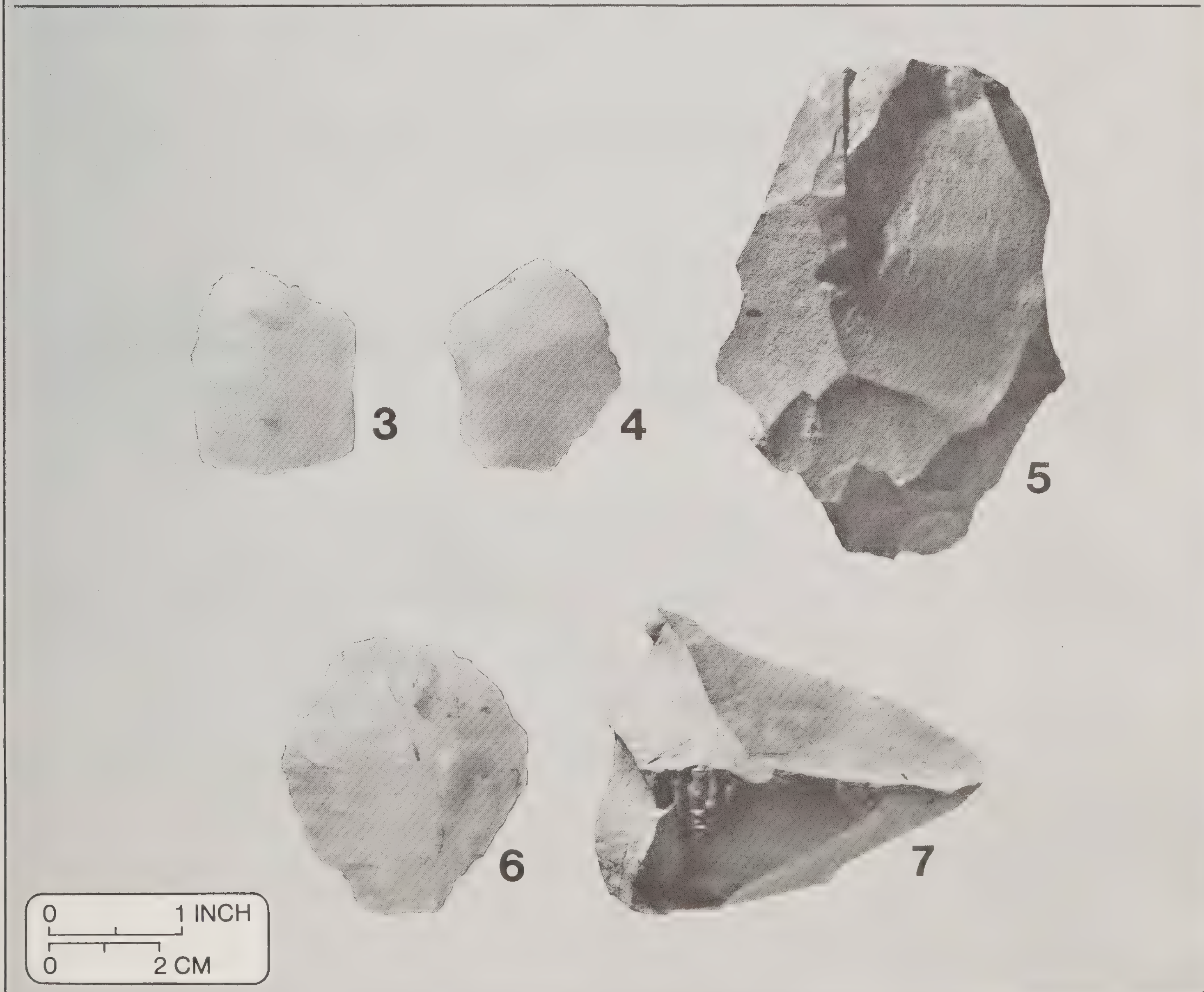
PLATE 19
COBBLE TOOLS, 31CH29, BLOCK A
AND 31CH8, BLOCK C

ARTIFACT PROVENIENCES — PLATE 20

1. 2.18.8
2. 2.16.16
3. 11.5.17
4. 13.5.21.3
5. 6.9.14.11
6. 10.19.12



DATA RECOVERY AT SITES 31CH29 & 31CH8
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PLATE 20
MISCELLANEOUS
CORE INDUSTRIES
31CH29-BLOCK A

Lamellae 3 and 2 Occupation Floors:

The final two occupation floors were only partially excavated due to the irregularities of the back-hoe stripping operation. Information is essentially confined to Excavation Units 5, 6, 9, 10, 11, 12, 13, 14, 15 and 16. This information is too dispersed for spatial analysis and the decreased area coverage also makes it difficult to compare these assemblages with those of the lower occupations. Consequently, descriptions of these assemblages will be less detailed (see Plate 17).

Lamella 3 Occupation Floor: Morrow Mountain Stemmed

Occupation of this floor is almost exclusively limited to the Morrow Mountain phase. The presence of two Guilford Lanceolate projectile points (Coe 1964:43-44) indicates a second phase occupation as well. From a cultural-historical standpoint the primary importance of this floor is the demonstration of successive occupations in which the Morrow Mountain I and II Stemmed styles co-occur. In this case, 11 of the 32 Morrow Mountain Stemmed points could be classed as type I.

I. *Personal Gear* again consists of two classes: 1) Projectile Points and 2) Bifaces.

Projectile Points:

1) Morrow Mountain Stemmed: Types I and II continue to co-occur providing stronger reason to suggest that morphological variability in these forms reflects life-history stage rather than cultural-historical significance. A total of 32 diagnostic Morrow Mountain Stemmed projectile points are associated with this stratum, an unusually high frequency. The magnitude of the remaining part of the assemblage also attests to the extremely dense nature of this occupation.

Table 9.37 displays summary statistics on the lamella 3 Morrow Mountain Stemmed sample. Comparison of this information with data on the lamella 5/4 sample (see Table 9.32) indicates a remarkable similarity which is confirmed by difference of means tests in Table 9.37. There appears to be very little, if any, change between the artifacts. Blade length at discard may be significantly greater in the occupation 5/4 sample, but only 20 of the 49 blades which comprise the two samples were whole and therefore measurable. In addition, both axial shortening and axial conservation are present as blade resharpening options which increases stochastic error in small samples.

Table 9.37
Summary Data for Morrow Mountain Stemmed, lamella 3

Summary Statistics, Morrow Mountain Stemmed, Occupation 3				Results of students' t-test: Morrow Mountain Stemmed, Occupation 5/4 vs. 3	
Dimensions	n	$\overline{x}$	s	t-value	Significance
Thickness	32	8.16mm	1.65mm	0.4650	P > .10
Base Width	25	7.32mm	2.12mm	0.1035	P > .10
Tang Width	31	14.68mm	2.61mm	1.2472	P > .10
Shoulder Width	31	24.97mm	3.95mm	0.6586	P > .10
Blade Width 2	28	18.32mm	4.00mm	1.0299	P > .10
Axial Length	10	45.50mm	11.30mm	1.8215	.05 > P > .025*
Tang Length	27	13.22mm	3.32mm	0.5642	P > .10
Blade Length	13	37.00mm	12.44mm	1.7744	.05 > P > .025*
Edge Angle	164	52.63°	13.64°	0.0112	P > .10
Tang Width to Base Width Ratio	25	220.92	90.86	0.2896	P > .10
Blade Width to Shoulder Width Ratio	28	71.68	18.06	0.9514	P > .10

*Significant differences at the .05 level for one-tailed tests.

The typological type I points of the sample again continue to exhibit characteristics of early life-histories (ie, excurvate blades, wide shoulders and crude retouch). Specimens 9·4·7·10, 9·4·4·8, 9·8·3·10, 11·7·2·1, 13·2·15·1, 13·8·14·2, 14·4·15·1, 14·3·15·1, 16·4·11·5, 16·5·12·1, and 16·7·14·1 are especially crude in their manufacture and they take on the appearance of preform-like blanks. The curvature of the original blank is still present, retouch is principally confined to the margins of the tools and the blade and haft element are only cursorily shaped. They take on a rather "expedient" appearance altogether and this may point to differences between the two types which are organizational rather than stylistic. It is possible that the type I form represents the earliest stage of the Morrow Mountain Stemmed life-history trajectory in which the projectile point gradually becomes more and more regularized through continued maintenance. On the other hand, this type may never attain the formal characteristics associated with type II. The type I forms may in fact simply represent expediently fashioned knives/projectile points which were designed only to serve immediate goals rather than to serve as a maintained element of personal gear. It has been demonstrated that such a process occurred in the hafted endscraper class which resulted in the complete elimination of endscrapers as a common, recognizable class of curated tool. The Morrow Mountain I Stemmed may constitute the beginnings of a

similar process in the developmental history of the projectile point. Given this interpretation, differences in the relative proportions of expediently fashioned and highly maintained Morrow Mountain Stemmed points on archeological sites may reflect significant functional variability at the organizational level. In this light, the differences in function between sites such as Icehouse Bottom (Chapman 1977) and Doerschuk (Coe 1964) where expedient types predominate, and the Haw site group where the highly maintained forms are more common, become an interesting research question.

2) Guilford Lanceolate: A total of two projectile points recovered from Lamella 3 correspond to the Guilford Lanceolate type as described by Coe (1964:43).

Stratigraphically, the Guilford Lanceolate type occurred between the Morrow Mountain Stemmed (Types I and II) and the Savannah River Stemmed type at the Doerschuk site. At the Gaston site it was associated with the lowest excavated component and was superseded by the Halifax Side-notched type which Coe (1964:123) observes "does not extend much farther south in the Piedmont than the Roanoke Basin." Based on a radio-carbon dated Halifax hearth (5440±350 yrs. B.P.) at the Gaston site, Coe (1964:44) estimates "a minimum date of 4000 B.C. for the Guilford phase.

The two examples of Guilford Lanceolate projectile points from the lamella 3 occupation are virtually whole. The very distal portion of the tip is missing from specimen 13·3·14·1 It exhibits a plano-convex cross-section. Metric dimensions for the two specimens are as follows:

	5·7·12·1	13·3·14·1
Thickness	9mm	9mm
Base Width	12mm	12mm
Shoulder Width	25mm	22mm
Axial Length	71mm	48mm
$\overline{x}$ Edge Angle	66°	68°

Both specimens have concave bases and the hafts contract towards the bases. The edges of both specimens exhibit polish from use.

3) Drill: A single drill, specimen 13·5·12·1, with a straight based, triangular haft was recovered from the occupation. The blade edges exhibit a slight polish and tip does not show differential wear intensity. Pertinent data are presented below:

Thickness:	5mm
Base Width:	21mm
Axial Length:	37mm

Tang Length:	8mm
Blade Length:	29mm
$\overline{x}$ Edge Angle:	63°

4) Projectile Point Fragments: Fragments consist of 11 Morrow Mountain Stemmed bases, 5 distal tips and 3 distal blade fragments. The basal dimensions indicate that these fragments represent nearly whole stems. Distal tip dimensions and acute tip fragment angles likewise suggest later stage breakage.

Bifaces: Sixty-five individual bifaces were recovered from the lamella 3 occupation. The biface/discoid core category includes 19 bifaces, while the combined category consists of 49 pieces representing 46 individual bifaces. Utilization percentage continues to be high in this class as a whole (see Table 9.37a); all of the biface/discoid cores and 93 percent of the combined category exhibit perimeter polish. Heavy end polish occurs on one biface/ discoid core and on nine of the smaller bifaces (combined category). Unifacial wear on plano-convex edges occurs on three of the former category and on two of the latter. The cores are generally plano-convex in outline as indicated by a height index value of 55.42 compared to 69.61 for the combined category.

II. Situational Gear consists of flake tools and miscellaneous cores.

Flake Tools: This category is composed of five basic categories: 1) Thick Unifaces, 2) Large, Acute-Angled Flakes, 3) Denticulate-edged Flakes, 4) Marginally Retouched Bifacial Tools and 5) Thin Unifacial Tools. Scallop-edged tools are absent from the sample, as are endscrapers and flake adzes.

1) Thick Unifaces: A total of five specimens (referred to as "Thick Uniface" in Table 9.38) of this category were identified. Retouch is unifacial and the working angle formed is characteristically steep. These unifaces appear to have been manufactured from split or "worn out" quartz globular cores. Dimensional and edge angle data are summarized below:

Thickness:	$\overline{x}$ = 21.20mm, s = 6.06mm
Width:	$\overline{x}$ = 33.20mm, s = 9.18mm
Length:	$\overline{x}$ = 52.40mm, s = 14.03mm
Edge Angle:	$\overline{x}$ = 74.67°, s = 9.72°
Weight:	$\overline{x}$ = 46.80gm, s = 10.85gm

Three of the specimens (13·5·17·1, 14·9·15·1, 11· ·1·8) are retouched along lateral edges, while the other two specimens (12·8·12·1 and 13·8·16·13) are retouched along their entire perimeters and are ovate or circular in shape.

Table 9.37a
Data on Bifaces from Lamella 3 Occupation Floor

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight
Biface/Discoid Core								
5·3·11·3	Whole	Ovate/Ovate	40	69	25	0.25	Unifacial Endwear X	78
5·5·13·5	End	Ovate			23	0.16	X	
5·3·13·8	Whole	Ovate/Irregular	57	80	42	0.27	X	161
6·2·13·2	Whole	Discoid	47	58	24	0.33	X	69
6·2·12·1	End	Ovate/	50		29	0.71	X	
9·2·3·3	Whole	Discoid	43	50	21	0.31	X	48
11·2·3·9	Lateral	Ovate/Ovate		62	16	0.60	X	
11·3·2·5	Whole	Ovate/Ovate	49	86	26	0.44	Unifacial Wear X	93
11·6·3·8	End	Irregular/			24	0.71	X	

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight
12·9·12·1	End	Ovate/	40		24	1.00	X	
12·8·11·2	Lateral	Ovate/		95	28	0.27	X	
13·7·15·9	End	Ovate/	72		22	0.83	Heavy End Polish X	
14·2·15·1	Whole	Ovate/	38	67	24	0.85	X	47
14· ·16·3	Whole	Ovate/Ovate	48	65	19	0.58	X	64
14·4·14·1	Whole	Ovate/Ovate	40	73	19	0.73	Unifacial End Wear X	54
13·2·15·2	Lateral	Ovate			20	0.82	X	
6·8·10·1	Fragment				22	0.29	X	
16·4·11·10	Fragment				15	0.67	X	
(Conjoined) 12·8·13·1 and 16·2·15·9	Whole	Ovate/Ovate	56	97	12	0.71	X	71
$\overline{x}$			48.33	72.91	22.89	55.42	100%	76.11
s			9.74	15.06	6.32	25.33		35.08

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight
Combined								
5·5·13·4	End Missing	/Subrectangular	42	55	13	0.86	X	
5·6·14·3	End	Ovate/			20	0.54	X	
5·3·12·9	Whole	Ovate/Irregular	38	62	17	0.42	X	36
5·4·12·4	Whole	Ovate/Ovate	35	59	16	0.78	X	30
5·4·10·1	Whole	Ovate/Ovoid	30	51	11	0.50	X	13
5·3·13·3	Fragment						X	
5·1·13·1	Tip	Lanceolate/			9	0.50	X	
6·4·14·6	Tip	Ovate/			10	0.67	Heavy End Polish X	
6·7·12·5	Lateral				14	0.56		
6· ·14·8	Whole	Ovate/Ovate	35	51	9	0.80	X	16
6·3·14·1	Tip	Lanceolate/			5	0.67	X	
6·8·12·7	Lateral				15	0.50		
9·8·4·2	End Missing	/Subrectangular	35		16	1.00	Quartz	

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight
9·1·3·7	End Missing	Ovate/	29		15	0.25	Unifacial Wear X	
9·7·4·6	End	/Subrectangular	40		13	0.86	Heavy End Polish X	
9·4·4·7	End	/Subrectangular			13	0.80	Heavy End Polish X	
9·5·4·4	End	Ovate/			8	0.60	X	
9·3·4·11	Tip	Ovate/			9	0.80	Heavy End Polish X	
9·4·3·5	Tip	Ovate/			9	0.50	X	
11·2·3·91	End	/Ovate			16	0.60	Heavy End Polish X	
11·2·1·1	End	Ovate/			15	0.36	Heavy End Polish X	
12·3·12·1	Whole	Lanceolate/Sub-rectangular	42	59	15	0.88	X	35

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight
13·1·15·2	Whole	Ovate/Ovate	31	68	13	0.63	Heavy End Polish X	
13·6·17·1	End Missing	Ovate/	31		12	0.33	X	
13·3·14·2	Fragment	Ovate/			16	1.00	X	
13·4·13·1	Whole	Ovate/Subrectangular	29	60	10	0.80	X	16
13·2·13·1	Whole	Ovate/Ovate	33	61	15	0.67	X	26
13·1·16·8	End	Ovate/			11	0.83	Heavy End Polish X	
13·5·14·1	End	Ovate/			10	0.25	X	
13·9·14·1	Tip	Ovate/			12	0.71	X	
13·2·14·2	Tip	Ovate/	27		8	1.00	X	
13·1·16·9	End	Ovate/	32		10	1.00	Heavy End Polish X	
13·2·16·10	End	Ovate	46		10	1.00	X	
13·2·16·2	End	/Ovate	32		10	0.43	X	

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight
13·7·16·5	End	Ovate/			8	1.00	Unifacial End Wear X	
13·2·16·1	Tip	Ovate/			10	0.80	X	
(Conjoined) 14·8·11·2 and 14·5·14·1	Tip	Truncated/			11	0.83	X	
14·7·14·1	End	/Ovate	29		15	0.67	X	
16·7·13·1	Tip	Ovate/			8	0.40	X	
16·3·11·2	Tip	Lanceolate/			11	0.83	X	
16·9·11·1	Tip	Lanceolate/			13	0.63	X	
16·4·12·2	Midsection				18	0.80	X	
16·8·13·2	Whole	Truncated/Ovate			11	0.57	X	15
(Conjoined) 9· ·6·2 and 9·7·3·1	Whole	Ovate/Ovate	37	71	8	1.00	X	21
9·8·3·11	Whole	Truncated/Ovate	30	52	12	1.00	X	18

Biface Category	Condition	Shape	Width	Length	Thickness	Height Index	Edge Polish	Weight
6·5·13·4	Tip	Lanceolate/					X	
$\overline{x}$			34.15	59.00	11.82	69.61	93%	22.60
s			5.22	6.57	3.70	21.96		8.57

2) *Large, Acute-Angled Flakes:* three large flakes (see Table 9.38) exhibiting acute cutting edges were recovered. The cutting edges of 16·8·13·3 and 13·8·17·1 were modified with casual, flat-angled, conchoidal retouch, while specimen 5·8·11·1 shows only edge fracturing and unifacial nibbling presumably resulting from use. Metric and edge angle data are summarized below:

Thickness:	$\bar{x}$ = 22.33mm, s = 5.03mm
Width:	$\bar{x}$ = 57.00mm, s = 13.53mm
Length:	$\bar{x}$ = 82.67mm, s = 27.32mm
Edge Angle:	$\bar{x}$ = 51.11°, s = 10.58°
Weight:	$\bar{x}$ = 89.67gm, s = 31.88gm

3) *Denticulate-edged Flakes:* Denticulate-edged retouch continued as a significant part of the flake tool assemblage in the Lamella 3 occupation. One lateral edge of specimen 16·5·12·2 exhibits denticulate retouch and the other lateral edge contains a steep angled unifacial retouch. Specimens 13·7·15·8 and 11·1·2·10 have, in addition to lateral denticulate edges, subrectangular distal edges which exhibit impact damage. The latter specimen shows unifacial fracturing and slight polish on the damaged edge. The former exhibits flat bifacial retouch to produce an acute working edge (53°). The edge outline is cup-shaped or "gouge-like" (see McPherron 1967). Both examples exhibit characteristics which would suggest chiseling. The other three specimens exhibit only denticulate edges.

Metric data on the flakes and edge angle data on the denticulate edges are presented below:

Thickness:	$\bar{x}$ = 14.17mm, s = 3.87mm
Width:	$\bar{x}$ = 29.17mm, s = 10.76mm
Length:	$\bar{x}$ = 72.17mm, s = 14.52mm
"Tooth" Edge Angle:	$\bar{x}$ = 67.31°, s = 8.64°, n = 16
"Concavity" Edge Angle:	$\bar{x}$ = 76.29°, s = 13.21°, n = 14
Weight:	$\bar{x}$ = 44.50gm, s = 35.93°

4) *Marginally Retouched Bifacial Tools:* This category consists of four small flakes (see Table 9.38) that have bifacially retouched marginal edges. Wear is similar to the perimeter polish on bifaces. It has been suggested that these tools represent expediently fashioned bifaces. A summary of data for the tools is presented below:

Thickness:	$\bar{x}$ = 11.00mm, s = 1.41mm
Width:	$\bar{x}$ = 31.50mm, s = 3.51mm
Length:	$\bar{x}$ = 43.00mm, s = 5.60mm
Edge Angle:	$\bar{x}$ = 57.08°, s = 6.40°
Weight:	$\bar{x}$ = 13.75gm, s = 2.50gm

Table 9.38 Morphological Characteristics of Flake Tools Stratum 3

Stratum 3	Sc.	Dent.	Uni.	Ser.	Oth. Bif.	V – Uni. Nib.	D – Uni. Nib.	Alt. Wear	Frac.	Bif. Nib.	Tot.	Combination	Alt. Ret.	Missing	Flake	Cortex	
5·3·12·8							LL RL				2			W	DF	2	
5·6·14·2						LL	P RL				3			D	DF	3	
5·9·14·6						RL		LL			2			W	FBR	3	
9·7·3·14						D					1			W	BCRF	2	
11·2·1·4						RL					1			W	FBR	3	
11·1·1·5						RL			LL	LL	2			D	FBR	3	
11·9·2·25							RL				1			W	FBR	3	
11·2·2·23																	
11·3·2·12							LL				1			W	FBR	3	
11·1·2·9						D, RL	LL				3			W	FBR	3	
11·3·3·1							LL	RL			2			W	DF	2	
12·8·12·1			LL, RL		D						3			P	Thick FB	2	Thick Uniface
12·5·12·1								LL RL			2			D	DF	3	
13·9·15·1								LL RL			2			W	FBR	2	
13·5·16·11								RL			1			D	BCRF	2	

Stratum 3	Sc.	Dent.	Uni.	Ser.	Oth. Bif.	V – Uni. Nib.	D – Uni. Nib.	Alt. Wear	Frac.	Bif. Nib.	Tot.	Combination	Alt. Ret.	Missing	Flake	Cortex	
13·8·16·13			LL, RL, D, P								4			W	Thick FB	3	Thick Uniface
13·8·17·1			LL								1			W	Thick FB	3	Large Acute
13·5·17·1			LL				D				2			W	BCRF	2	Thick Uniface
14·9·15·1			RL								1			LL	Thick FB	3	Thick Uniface
11· ·1·8			LL								1			W	Thick FB	3	Thick Uniface
12·8·11·1		LL									1			W	Thick FB	2	Denticulate
11·2·2·3							LL RL				3	Notch RL-V-U-Nib		W	FBR	3	
11· ·2·4							D LL				2			W	BCRF	2	
11·5·3·3					LL						1			D	BCRF	2	
11·1·2·10		D-RL					LL D				4	Notch RL		W	BCRF	2	Denticulate Chisel?
11·1·1·7							RL LL				2			P	FBR	3	
11·2·2·2			V-RL V-RL								2			D	DF	3	
5·8·11·1							LL				1			W	Thick FB	3	Large Acute
13·1·13·3					RL						1			W	BCRF	2	Bifacial

Stratum 3	Sc.	Dent.	Uni.	Ser.	Oth. Bif.	V – Uni. Nib.	D – Uni. Nib.	Alt. Wear	Frac.	Bif. Nib.	Tot.	Combination	Alt. Ret.	Missing	Flake	Cortex	
13·7·13·1						RL	LL				2			W	BCRF	3	
13·2·14·1					LL						1			W	BCRF	3	Bifacial
13·1·14·2		LL									1			W	CR FBR	2	Denticulate
14·6·13·1	D-RL							LL			2			W	CR FBR	3	
16·5·12·2		D-LL	RL								3	Point RL/LL		W	FBR	2	Denticulate
16·1·12·1			V-RL			D					2			LL	BCRF	3	
16·2·12·1							LL				1			W	FBR	3	
16·8·13·3							D				1			W	BCRF	2	Large Acute
16·9·12·1			V-LL			RL					2			W	CR FBR	2	
14·7·13·1						LL				RL	2			W	CR FBR	2	
16·4·13·7		LL									1			W	BCRF	3	Denticulate
13·7·15·8		D-LL			D						2			W	BCRF	2	Denticulate/ Chisel?
13·6·15·1					RL						1			LL, D	Indet	3	Bifacial
13·2·13·3					RL, LL						2			P	Indet	3	Bifacial

5) Thin, Miscellaneous Unifacial Tools: The final 27 flake tools can be placed in a thin, light-duty cutting/scraping category. One specimen, 13·2·12·1, contains a small-corner notched tang and appears to be an expedient hafted knife. The tool is manufactured from a thin, side-struck flake of biface core reduction. The cutting edge has been unifacially retouched to produce an acute angle averaging about 45°. The data summary indicates a highly variable category of tools:

Thickness:	$\overline{x}$ = 11.14mm, s = 5.90mm
Width:	$\overline{x}$ = 32.26mm, s = 8.95mm
Length:	$\overline{x}$ = 46.56mm, s = 13.08mm
Edge Angle:	$\overline{x}$ = 53.18°, s = 45.66°
Weight:	$\overline{x}$ = 22.48gm, s = 28.76gm

Miscellaneous Cores: Split Quartz Cores, Quartz Core Slugs and Core Fragments, and Expedient Cores comprise the Miscellaneous Core class.

1) Split Quartz Cores number four from this occupation. Their dimensions are: Length, $\overline{x}$ = 39.00mm, s = 6.88mm, Width, $\overline{x}$ = 33.00mm, s = 6.93mm; Thickness, $\overline{x}$ = 17.50mm, s = 2.89mm; Weight, $\overline{x}$ = 29.50gm, s = 17.62gm.

2) Quartz Core Slugs and Fragments include ten specimens. Only two of these, specimens 9·9·3·7 and 9·8·3·8, represent core slugs. They weigh 85 grams and 163 grams respectively. The remaining eight specimens are fragments with a mean weight of 38.62 grams with a standard deviation of 13.90 grams.

3) Expedient Cores consist of two specimens, 9·1·4·9 and 11· ·2·6, of a green metavolcanic material corresponding to Raw Material B, andesitic felsite. The latter specimen is a small core fragment which appears to have been derived from the larger core. It weighs 138 grams. The other specimen weighs 609 grams and was derived from a larger mass of material by a percussive blow evidenced by a bulbar, ventral surface. Only one whole scar is evident; it measures 65mm in length and 37mm in width. The dimensions of the core are 106mm x 100mm x 49mm.

III. Site Furniture from the lamella 3 occupation consists of three hammerstones, one spall chopper and one grinding stone or mano.

Hammerstones: Two small, circular cobble hammerstones, 9·5·3·6 and 5· ·12·2, were recovered which correspond to Coe's (1964:79-80) type V: "Hammerstones of this type were round and, frequently, were completely spherical in shape. Most of these specimens were made from greenstone or quartz, and they were abraded over their whole surface." One specimen was composed of quartz and the other was made of a granitic stone. Their dimensions are:

9·5·3·6: 55mm x 46mm x 41mm, 151 grams
5· ·12·2: 53mm x 53mm x 34mm, 140 grams

The other hammerstone is made of a large, tabular, dense metavolcanic river cobble which corresponds to Coe's (1964:79, 80) type IV hammerstone: "This type of hammerstone was made from a bar-shaped fragment of rock that varied from 12 to 20cm in length and weighed from 16 to 50 oz." Specimens 5· ·11·7 is 122mm x 68mm x 55mm in size and weighs 925gms. The dark patina has been removed entirely along the edges, and partially on both faces by abrasion. This indicates that this object was probably used as a grinding stone rather than a hammerstone.

Cobble-Spall Plane or Chopper: Chapman (1977:92-93, 1975:157-165) reports the use of large cobble spalls as choppers at the Icehouse Bottom and Rose Island sites. The objects he discusses have been bifacially flaked to produce a cutting edge. Specimen 5· ·12·10 has not been treated in this manner. The edges are unmodified by retouch, but the severe edge crushing and rounding exhibited along the acute transverse edge indicates that this cobble was used either as a plane or chopper. The angle formed along this edge averages 75°. The dimensions of the tool are 94mm x 69mm x 34mm and it weighs 400 grams.

Mano: Specimen 5·6·14·1 represents a subrectangular, heavily ground mano which was found in two pieces within a rock cluster (Feature 33). It had obviously been recycled for use as a hearth stone after its use-life as a grinding stone. The specimen is regular in shape, exhibiting heavy grinding on both faces and all four edges (see Plate 19). The combined weight of the two pieces of stone is 727 gms.

Lamella 2 Occupation and Test Pit Information

Excavation in the lamella 2 floor was limited to areas undisturbed by the back-hoe during stripping activities. The amount of material recovered is severely diminished, even in comparison to lamella 3, and while the information is of little use for spatial analysis or inter-assemblage comparisons, it is useful for describing the general nature of the Late Archaic sequence at 31Ch29. Therefore, the diagnostic projectile point sample will be presented here. The data on the remaining artifacts (15 biface fragments, 8 projectile point fragments, 11 flake tools and 1 split quartz globular core) are not presented. This information will be used to compare the later cultural-historical data from the seven test units (see Chapter 4) dug during the initial stages of excavation and the Archaic sequence of Block A.

Projectile Point Assemblages: Projectile point types from lamella 2 consist of: seven Morrow Mountain Stemmed (Coe 1964:37), one Guilford Lanceolate (Coe 1964:43), two Halifax Side-notched (Coe 1964:108), one Savannah River Stemmed (Coe 1964:44), one small, square stemmed type, and one small, side-notched type. Obviously this surface represents a Middle to Late Archaic contact zone.

Elevationally correlated data from the test units are similar to data from this floor and the earlier lamella 3 floor. This information is presented in Table 9.39. The presence of an unidentified stemmed projectile point in the correlated lamella 2 of Test Unit 6 is consistent with the transitional nature of lamella 2 in Block A. However, a major surprise is encountered when the rest of the sequence is viewed. The Morrow Mountain Stemmed type persists through at least the next three occupations. This strongly suggests that Coe's (1964:43) observations concerning the stratigraphic placement of the Morrow Mountain Stemmed type in fact accurately reflects the persistence of this style into the Late Archaic and possibly Early Woodland. At the Doerschuk site, the type II point persisted into both the Guilford (Zone VI) and Savannah River (Zone VII) components (Coe 1964:35).

Table 9.39
Correlation of diagnostic projectile points from 31Ch29 Test Units with Block A lamellae

	TU1	TU2	TU3	TU4	TU5	TU6
Woodland Occupation						
Occupation E			Otarre (1) Small Contracting Stem (1)			
Occupation D		Triangular (1) (Yadkin?)				
Occupation C			Morrow Mt. II (1)			
Occupation B			Morrow Mt. II (3)	Morrow Mt. I (1)		Small, side-notched-stemmed (1)
Occupation A			Morrow Mt. II (2) Morrow Mt. I (1)	Morrow Mt. II (1)		
Lamella 2 (Block A)					Morrow Mt. II (1)	Square Stemmed Variant (1)
Lamella 3 (Block A)					Morrow Mt. II (1)	

One question that might be asked about these data is whether there are any differences between the earlier Morrow Mountain Stemmed type and its later manifestations. Students t-test run against the metric and edge angle date for the lamella 3, block A sample and the upper level test unit data, 31Ch29 suggests that there are indeed some significant differences (see Table 9.40). Change does not appear to effect the hafting element, but is confined to changes in blade maintenance. The blade becomes significantly more incurvate and the edge angle at discard increases substantially. Shoulder width appears to decrease in response to these changing patterns of blade treatment.

Thus, the Morrow Mountain Stemmed projectile point appears to encompass a greater temporal span than previously thought, extending into the Late Archaic or beyond (see 31Ch8 discussion). The only changes that occur between its earliest and latest manifestations relate principally to blade maintenance.

Table 9.40
Summary Data on Morrow Mountain Stemmed in Test Units and lamella 3, Block A

	Upper Levels			t-tests: Lamella 3 sample vs. Test Unit sample	
	n	$\bar{x}$	s	t-value	Significance
Thickness	9	7.78mm	1.56mm	0.6024	$P > .10$
Base Width	6	7.17mm	3.13mm	0.1358	$P > .10$
Tang Width	9	15.00mm	2.96mm	0.3059	$P > .10$
Shoulder Width	9	22.22mm	3.31mm	1.8554	$.05 > P > .025$*
Blade Width 2	6	12.33mm	3.93mm	3.2393	$.005 > P > .0005$*
Axial Length	6	42.83mm	7.19mm	0.4856	$P > .10$
Tang Length	7	15.43mm	3.41mm	1.5140	$.10 > P > .05$
Blade Length	6	27.33mm	5.05mm	1.7362	$.10 > P > .05$
Edge Angle	40	67.28°	11.25°	6.2601	$.0005 > P$*
Tang Width to Base Width Ratio	6	250.50	98.37	0.6814	$P > .10$
Blade Width 2 to Shoulder Width Ratio	6	57.17	12.48	1.8184	$.05 > P > .125$*

*Significant differences at the .05 level for one-tailed tests

LITHIC ASSEMBLAGE ANALYSIS – 31CH8, BLOCK B AND BLOCK C

Several factors undoubtedly have affected the natural and cultural stratification processes at 31Ch8. Excavation Block C was situated to take advantage of a previously unknown site area with evidence of an organic midden underlain by the usual alternating sand/

clay lamellae formations found elsewhere. Block C was excavated to recover information on prehistoric site components from later Archaic and Woodland substage occupations and to sample, if present, preserved organic remains of bone, shell or carbonized plant remains. Factors mitigating against complete realization of those goals include: 1) recent disturbance to upper soil horizons caused by land clearing (especially tree removal) operations; 2) compression of later prehistoric occupational debris into homogeneous layers by soil formation processes and cultural activities such as pit excavations and the like; and 3) difficulty in segregating occupation floors because clay lamellae in near-surface contexts were disturbed or non-existent, precluding or at least compromising their utility as depositional markers.

Given this situation, isolation and description of Archaic and Woodland stage artifact assemblages at Block C, 31Ch8, cannot be accomplished with the same precision as at Block A, 31Ch29. A possible advantage realized at 31Ch8 is the presence of prehistoric ceramic sherds in the upper zones of site matrix. Those exhibit certain temporally and culturally diagnostic attributes, described elsewhere in this report, which aid in the interpretation of later prehistoric occupations of the Haw River locality.

Lithic artifact assemblage segregation at Block C, 31Ch8, remains a problematic process. Four soil strata and attendant assemblages are described in the following paragraphs. They are supplemented by a more limited artifact set from the excavation of EU3, Block B, which was intended to provide data from the lower (Middle and Early Archaic) strata at 31Ch8, comparable to the information gained from the Block A excavations at 31Ch29. Specimens recovered from EU3, Block B are segregated stratigraphically by the sand and clay lamella divisions described for 31Ch29. The limited size of that unit (3m x 3m) precludes attempts to defend that information as complete living floor or occupation zone data; rather, they are provided to flesh out the stratigraphic sequence from 31Ch8 and 31 Ch29, as a complete record from late Paleo-Indian through at least Late Woodland times.

The definable occupation levels for Block C data thus are highly variable in the degree to which they reflect mixing of temporally discrete activity sets. That situation is most pronounced in deposits nearer the present ground surface, since all defined disturbance factors have operated on those zones, particularly mechanical mixing by heavy earthmoving equipment. Our confidence in assigning any tool to a specific, analytically meaningful locus in three-dimensional space varies directly with increased depth below the surface, keeping in mind the potential disturbance processes affecting those levels.

Four strata were defined at Block C, 31Ch8, on the basis of observable changes in soil color, texture, organic content and the presence of a few ephemeral clay lamellae. A cap of dense, silty soil mixed with numerous roots and pieces of burned and rotting wood covered the surface of Block C, which was removed by shovelling and discarded. Cursory examination was made of this matrix but few artifacts were noted; no screening was performed, so a minimal number of artifacts may have been overlooked within highly disturbed contexts.

Stratum 1 of Block C includes a dark, probably organically-stained layer of sand found immediately below the removed silt/root layer. Occasional traces of a thin clay lamella were recorded in profile drawings of this stratum, but were too discontinuous to permit adequate tracing of a contact zone.

An abrupt termination of the dark soil zone labelled Stratum 1 occurred in most areas of Block C. Extending to an average depth of 40 cm below datum (elevation 99.60m), the second defined stratum includes a clear, yellow/tan sand zone terminating with the first clearly discernible clay lamella. Since clay lamellae found at higher elevations throughout the site were very thin (often 1mm or less in average thickness), it was often difficult to reconstruct the lower boundaries of Stratum 2 from available photographs, drawings or other field data sources.

Stratum 3 of Block C is comprised of the next sequential interlamellar sand zone and clay lamella. Average elevation of the bounding lamella for Stratum 3 is between 99.45 and 99.55m. Stratum 3 was the most clearly definable soil zone at Block C, except in EUs 3 and 7, where massive disturbances by tree root systems were encountered. Otherwise, the third stratum was basically horizontal with only minor variations in depth, as noted, with an average thickness of 15-20 cm.

Associated sand and clay lamella soil zones constitute the fourth stratum at Block C, which is again oriented roughly horizontally to the ground surface and soil horizons defined elsewhere during the 1979 excavations. The phenomenon of increased lamellar thickness with increased depth is evident in Stratum 3, although the conjoined sand level retains a fairly typical thickness of 15 cm. Clay-charged sands making up the lamella at the base of Stratum 3 averaged 1.5 to 2 cm in thickness, permitting easier definition of the soil boundary, however, the same lamella exhibited a greater fluctuation in average depth and more bifurcations than other clay lamellae at 31Ch8, Block C. Factors influencing variations in placement and appearance of clay lamellae relative to natural and cultural strata have been discussed previously and should apply equally here.

A fourth sand level was exposed in only a few instances during Block C excavations While it can reasonably be assumed to constitute a fifth stratum, too little of that zone was explored to allow adequate definition of an assemblage. The third clay lamella, marking the base of Stratum 4, generally coincided with terminated arbitrary levels at 99.30m. The incompletely-defined Stratum 5 was nevertheless observed in profile in EUs 1, 3, 4 and 9 of Block C near that elevation, although no artifacts were recovered. A single hafted biface of probable Middle Archaic (Halifax-style) appearance was found in Stratum 5 (arbitrary level 12) of EU7, where excavations were conducted to a depth of 15 cm below the other units.

As discussed previously, artifacts recovered from the single EU3 dug in Block B will be described here for purposes of stratigraphic continuity and general comparison with the Block A, 31Ch29 information.

Artifacts were recovered from 33 arbitrary 5 cm levels at EU3, Block C, 31Ch8. Numbered as levels 13 through 45, relative to an arbitrary datum of 100m, they extended at least 20 cm into sterile basal sediments analogous to those encountered at Block A, 31Ch29 and in various deep test trenches. No artifacts were found below arbitrary level 41, situated at the contact below alluvial sands and the basal clay zone, which presented a regularly horizontal position at elevation 97.95m. Maximum depth of the excavation unit below surface was 1.75m, insuring adequate controlled exposure of sediments and cultural zones at this portion of 31Ch8.

Natural Strata numbered 4 though 15 were subsequently isolated at EU3, Block B, utilizing a consistent strategy of identifying individual lamellae and superimposed sand layers as potential cultural occupation floors. Stratigraphic and numerical continuity with the adjacent Block C strata are insured through elevational, soil and artifactual data, thus making comparable the strata labelled 4 at both site areas and extending the sequence through 15 strata and almost 2m of deposits. This adds justification for a detailed description and analysis of lithic and ceramic assemblages from Block C and Block B excavations, since they constitute a complete, intensive stratigraphic sequence of artifactual variability at 31Ch8.

Numbered strata at Blocks B and C in all probability are comparable temporally and culturally with analogous units from 31Ch29 but cannot be equated on a one-to-one basis using our arbitrary numerical designations. Thus, Stratum 12 at Block C should be roughly contemporary with Stratum 12 at Block A, but not strictly comparable. Despite very real similarities in soil stratigraphy and artifact assemblages, we cannot presume to exactly equate functional postures of site occupations located some 500m apart.

BLOCK B

Excavation procedures for the Block B area of 31Ch8 have been discussed previously (Chapter 4). A single 3m X 3m EU was chosen for complete excavation to the base of cultural deposits, thus providing a sample of Archaic stage materials in that area of the site complex.

Artifacts described in the following paragraphs have been arranged by natural levels ("strata") in a fashion analogous to the descriptions for Block A, 31Ch29 assemblages. Certain parallels can be drawn between strata and assemblages from the two site areas, but exact correlations are difficult, if not impossible. The EU3, Block B excavation data provide

better stratigraphic continuity with the larger-scale excavations of Block C, 31Ch8, an immediately adjacent locus where attentions concentrated on recovery of later Archaic and Woodland stage information from near-surface contexts.

No attempts are made to present the Block B data as interpretable horizontally-arranged occupation floors. Instead, the brief descriptions that follow serve to characterize changes in assemblages through a sampled vertical and temporal progression of Early, Middle and Late Archaic artifacts. Naming of occupation levels by established cultural-historical identifiers is minimized, due to non-recovery of diagnostic tool forms.

Lamella 15 — Early Archaic

Items found in and below lamella 15 include a small assortment of curated and expedient tool forms. The natural strata producing those items occur immediately above the sterile, basal sediments of the Haw River environs which are assignable to the Pleistocene.

I. *Personal Gear* consists of a hafted biface, an unhafted biface, one modified prismatic flake-blade and two biface fragments.

Projectile Points: A single point fragment was found in lamella 15, consisting of the haft element and proximal blade portion of a broadly side-notched, concave base point (Plate 21). The blade of specimen 3·9·40·3 has broken transversely approximately one-half to two-thirds the total distance from the base. No attempts were made to rework the distal edge or otherwise maintain the point. Metric dimensions are as follows:

	mm
Base Width	24
Tang Width	18
Tang Length	22
Shoulder Width	28
Axial Length	33

Side notches were formed by removal of one or two broad flakes from each lateral edge, while the basal concavity exhibits both large and small flake scars and step fractures. Haft element grinding is minimally present along the lateral tang margins.

Similar point forms have been found in surface contexts at other sites in the Jordan Reservoir and identified variously as Big Sandy or "Type A" variants (Smith 1965:88-93). Hafted bifaces of this generalized morphology are problematic, occurring in Early through Late Archaic contexts throughout the Southeast (Lewis and Lewis 1961:36; DeJarnette et al. 1962:49). Given the stratigraphic placement of this specimen and associated tool forms, we are willing to assign it to the Early Archaic.

Bifaces: A single biface was found in lamella 15. Provenience is 3·8·41·3 and it is illustrated in Plate 21. The tool exhibits a plano-convex transverse cross section and represents a bifacially thinned flake blade; a small portion of the original flake ventral surface is present. The non-symmetrical appearance of 3·8·41·3 is due to repair of a transverse break either at the time of manufacture or during later use. Several hinge fractures are present on dorsal and ventral faces of the base which represent either attempts to remove (thin) the original flake platform and/or use of this item as a wedge. Presence of numerous small step fractures along the base attests to the latter interpretation.

One biface fragment, 3·6·41·1, is the proximal corner of a thin (5mm), acutely-edged bifacial tool. Minimal edge damage in the form of small step fractures is present. The second biface fragment, 3·2·40·1, is an overshot flake removed while thinning a larger biface. The platform has collapsed during removal, but eraillure scars evidence the direction of the percussive blow. Cortex is present on 10 to 15 percent of the remaining bifacial edges, in combination with some edge rounding due to either use attrition or platform preparation.

Unifaces: Specimen 3·5·40·2 is a large, parallel-sided flake tool, conforming to the category of prismatic flakes (PF) identified in the 31Ch29 assemblages. Dimensions of the piece are: length — 89mm; maximum width — 34mm; maximum thickness — 11mm. The tool has been marginally retouched and/or utilized on most edges, particularly the right lateral dorsal and distal ventral surfaces (Plate 21).

II. Situational Gear

Edge-damaged flakes: a single fragmented flake tool was found in lamella 15, which exhibits minor rounding and "nibbling" characteristic of utilization as an expedient cutting or scraping tool. Specimen 3·9·41·2 has a total of 72mm of utilized edges, distributed equally between the left and right lateral margins.

Lamella 14

No tools were found in lamella 14, indicating perhaps abandonment of the site for some period of time, but more likely representing sampling bias within an area of only 9 square meters.

Lamella 13

This stratum at Block B, EU3 provided no typically diagnostic hafted bifaces or other tool forms. The mixture of bifacial and unifacial tools, in conjunction with the stratigraphic position of those items argues for an Early Archaic designation of this assemblage sample.

I. *Personal Gear* consists of two whole and two fragmented bifaces; all appear similar to specimens recovered from Early Archaic Palmer or Early Kirk strata at 31Ch29.

Bifaces: Specimens 3·8·35·2 and 3·5·33·2 are whole, bifacial knives or preforms (Plate 21). The former is made of quartz and has an asymmetric, roughly lanceolate outline. Maximum dimensions are: length — 73mm; width — 28mm, thickness — 10mm. A transverse section of the tool is roughly biconvex, although lateral edge resharpening has tended to provide a bevelled and sinuous edge on the right and left lateral portions.

The second whole biface is somewhat larger than the first specimen, with maximum dimensions as follows: length — 75mm; width — 43mm; and thickness — 10mm. Specimen 3·5·33·2 has a symmetrical outline and retains the platform (obliquely-oriented and bi-faceted) and ventral surface of the original flake blank. In combination with noticeably reduced average edge angles (50° for 3·5·33·2 *vs.* 62.5° for 3·8·35·2), these factors argue for a less-advanced stage of production and use for the second specimen. Width reduction and increased edge angles appear to be good measures of variability for non-hafted bifacial tools.

Broken bifaces are represented by specimens 3·8·34·7 and 3·4·34·2. The former is the distal portion of a thin biface, 37mm wide and 9mm thick, broken transversely approximately one-half the projected length of the whole tool. Remaining length is 58mm. Diminutive hinge fractures and smoothing are present on the lateral edges of 3·8·34·7, but few marginal retouch scars are present, indicating that few attempts were made to rejuvenate the edges prior to breakage and discard.

Specimen 3·4·34·2, exhibits eight marginal retouch flake scars and limited edge damage along the lower lateral portions of this proximal biface fragment. Edges are roughly parallel and the item is biplano in transverse section. Recoverable dimensions are: width — 32mm; thickness — 10mm.

II. *Situational Gear:* A more varied collection of expedient tools was recovered from lamella 13 than 15, including two purposely-modified and four edge-damaged flake tools. At least five raw material categories are present, indicating the availability of varied lithic sources at the Haw River location.

Retouched Flakes: Specimen 3·8·34·8 is a wedge-shaped quartz flake with unifacial retouch along one edge. Four flakes have been removed, producing a denticulated edge, with some rounding and step-fracturing present; average edge angle is 40 degrees along the left lateral edge. The other retouched flake, 3·2·33·1, is the distal portion of a unifacially retouched, parallel-sided flake tool. Triangular in cross-section, the tool was formed by removal of several large (> 8mm in width) flakes from either edge of a secondary flake 26mm wide and 11mm thick.

Edge-damaged Flakes: Four examples of edge-damaged flakes were found in lamella 13, all of meta-volcanic raw materials. Summary descriptive statistics are as follows:

Specimen	Max. Length	Max. Width	Max. Thick.	Length of Util. Edges	Av. Edge Angle
3·5·34·3	47mm	48mm	17mm	90mm	44.7
3·9·34·6	45mm	53mm	8mm	42mm	46.2
3·6·34·4	48mm	33mm	5mm	72mm	40.3
3·9·34·5	44mm	46mm	7mm	128mm	35.3

The first specimen, 3·5·34·3, is a blocky core reduction flake, while the others are typical FBRs. Overall dimensions are relatively similar, perhaps indicating selection for flakes of a certain size. Thin edge angles may likewise reflect attribute selection for specific activities such as cutting or slicing — an interpretation supported by an apparent spatial clustering in squares e, f and i of EU3.

III. Manufacturing Debris: A possible core fragment was found in lamella 13. Formed of quartz, specimen 3·8·34·9 exhibits two or three large flake removal scars and weighs 68.4 grams.

Lamella 12

Lithic tool forms excavated from lamella 12 resemble the miscellaneous collection of bifaces and unifaces from the underlying lamella 13 of Block B, EU3. Two biface fragments and eight whole or broken unifacial tools comprise the sample, which also generally resembles those from Early Archaic levels at Block A, 31Ch29.

I. Personal Gear:

Bifaces: Two bifacial tool fragments consitute the personal gear inventory from lamella 12, EU3. One (3·8·32·8) is the proximal portion of a thin (5mm) biface and may be the tang or haft element of a stemmed, hafted biface .

The calculated index for 3·7·32·8 is 133.3, which indicates a contracting stem near the range of the Stanly cluster identified in Table 9.25. Although an argument based on a sample of one of is tenuous, stratigraphic position and associated tool forms might allow assignment of this specimen and the lamellar contents to a late Early or early Middle Archaic placement.

The distal (?) portion of a second biface also was recovered in lamella 12, exhibiting moderate to severe edge damage on remaining bifacial edges. The apparent tip of specimen 3·9·33·3 is formed by the intersection of two large flake scar portions, one of which may be the unmodified platform of an original flake blank. The item is 31mm wide, 10mm thick and the average edge angle is 63 degrees.

II. Situational Gear is made up of five purposely-modified unifacial tools and two utilized flakes from lamella 12.

Retouched Flakes: Specimens 3·3·32·3 and 3·9·33·4 are thick, trianguloid flake tools with asymmetric triangular cross-sections. Both have been modified by flake removals from the longest lateral edge, subsequently altered by numerous step fractures during use. Steep edge angles (65-75° average) and overall morphology permit their identification as probable sidescrapers, similar to those identified by Coe (1964:51,78) as (Early?) Middle Archaic Type II forms. General dimensions for 3·3·32·3 and 3·9·33·4 (respectively) are: width — 43 and 32mm; length — 81 and 52mm; maximum thickness — 22 and 20mm. The first specimen has a total length of retouched edge equalling 75mm while 3·9·33·4 measures 86mm. Average edge angles are 43.3 degrees and 58.5 degrees, respectively.

A third flake tool, 3·7·33·5, exhibits a scalloped edge produced by snapping off portions of the thin flake edge. Projections between adjacent scars thus formed exhibit slight wear in the form of edge rounding, observable under low-power magnification (10x). The flake is a thin (5mm), fairly broad (37 x 36mm) triangular FBR. Minor edge damage is apparent also in the two remaining edges.

Two thick quartz flakes or core fragments have steep-angled flake removals on their dorsal faces and may be identified as expediently produced endscrapers. Specimens 3·3·32·2 and 3·9·32·7 (Plate 21) are hemispherical in shape. Selection of quartz and production of steep-angled working edge angles ($\bar{x}$ = 90.3°, s = 5.4° in these cases) indicates the need to produce strong, durable edges.

Edge-damaged Flakes: Two specimens from lamella 12 fill this category. Items 3·1·32·1 and 3·4·32·6 are thin FBRs with edges showing signs of use as expedient cutting or scraping tools. Edge rounding and hinge fractures along a 22mm portion of the latter tool's edge is evidence also for use on resistant material such as wood or bone. Dimensions follow:

Specimen	Max. Length	Max. Width	Max. Thick.	Length of Util. Edges	Av. Edge Angle
3·4·32·6	65mm	29	5	127	25.6°
3·1·32·1	54mm	33	5	22	22.0

Lamella II – Early/Middle Archiac

This stratigraphic level produced a single tool considered potentially time-sensitive in its overall morphology. Other specimens include biface and uniface forms consistent with late Early Archaic examples and levels discussed at 31Ch29, Block A.

I. *Personal Gear* are items with evidence of continued maintenance, and include a hafted drill (3·1·32·4), one complete unhafted biface (3·1·30·1) and two biface fragments (3·1·31·5 and 3·1·31·8).

Drill: this artifact class of "drills" or perforators was poorly represented at the Haw River sites, a situation shared by Coe at the Doerschuk and Hardaway sites (1964:51-52, 72-73). The entire specimen referenced here was found in two sections – the stemmed basal portion (3·1·32·4) and a smaller, very worn distal fragment (3·1·31·1). After refitting, the complete item is characteristic of hafted Kirk or Stanly phase varieties illustrated for the Yadkin River sites mentioned above (Coe 1964:Figures 32A and 62A). Those latter examples were identified on the basis of associated projectile point forms as well as their own morphological attributes. Specimens illustrated by Coe have basal configurations similar to either late Kirk serrated or Stanly-type projectile points, from which they were probably made. The 31Ch8 specimen exhibits a generally analogous basal configuration, although no basal concavity is present (Plate 21). A tang/base width index of 105.0 resembles that of the Kirk stemmed or Stanly-phase projectile point samples from 31Ch29 (Table 9.28), further confirming Coe's interpretations.

Other dimensions of specimen 3·1·32·4/3·1·3·1 are as follows; axial length – 68mm; width at shoulders – 29mm; maximum thickness – 9mm; blade length – 42mm. Smoothing of flake *arris* and all lateral edges is pronounced, a condition noted by Coe (1964:72-73) for two Hardaway-associated specimens. Haw River artifact wear patterns suggest analogous functions were performed during later Archaic times by similar tools.

Bifaces: three bifacial tools from lamella 11 include one whole and two fragmented examples. Catalog number 3·1·30·1 was formed by incomplete bifacial percussion thinning of a thick flake. A large (34mm x 15mm), unmodified flake platform is present on the ventral tool surface. This item is made of a coarse-grained raw material (Category A – latite porphyry) which may have contributed to its rapid edge attrition and discard. Numerous hinge fractures along the lateral edges attest to application of significant pressures during cutting or scraping activities, and probably inhibited attempts to rejuvenate the tool through controlled flake removals. Major tool dimensions include: length – 71mm; width – 37mm; thickness – 14mm.

Specimens 3·1·31·5 and 3·1·311·8 are bifacial tool fragments from lamella 11, made of quartz and latite porphyry, respectively. The first item is the proximal section of a bifacial knife, 36mm wide and 12mm thick. Biconvex in cross-section, 3·1·31·5 is a fairly typical

example of Archaic biface forms broken transversely across the blade width during use or edge resharpening activities. Tool fragment 3·1·31·8, by contrast, is a diminutive (.5 gm) base or tip fragment recovered from the lamella 11 debitage collection. No further analysis seems appropriate, although some edge damage in the form of small step fractures is visible on the remaining tool fragment edges.

II. Situational Gear consists of expedient tools from lamella 11 including two unifacially modified pieces and a single utilized flake.

Retouched Flake: specimen 3·6·30·5 is a thick biface reduction flake, possibly removed from a specially prepared bifacial core. The dorsal surface is covered with broad, thin flake scars while the ventral flake surface exhibits only a limited number of abruptly-terminated flakes. The latter flake removals created a sinuous bifacial cutting edge along the left lateral and distal margins of the tool, rather than thinning the flake blank in a tool production trajectory common to bifaces. Rounding of flake scar ridges and minor step-fracturing attest to utilization of the formed working edges. Utilization attrition is present also on the right lateral edge, where a 70-75 degree angle is created by the intersection of a planar flake or nodule surface with the bifacial parent core surface. General dimensions of the tool are: length — 56mm; width — 33mm; thickness — 10mm.

A third example of a roughly hemispherical quartz "golf ball" scraper was recovered from this stratum (see lamella 12 descriptions). Production of artifact 3·6·30·13 involved halving of a spherical quartz cobble, followed by unifacial marginal reworking of the steep-edged dorsal surface. A minimum of eight percussion blows, directed from the ventral surface, were used to form an abrupt working edge on the tool, with an average edge angle of 82 degrees (averaged from four measurements). Little sign of purposeful tool edge rejuvenation is present, although numerous small step fractures and crushing-type scars evidence the heavy pressures applied to the "business end" of this artifact. Dimensions are: thickness — 27mm; width — 43mm; length — 41mm; weight — 69.3 gm.

Edge-damaged Flakes: a single edge-damaged FBR was found in lamella 11. Brief use of this item as cutting tool has produced 13 mm of damaged edge on a flake measuring 49 x 41mm. Other than the obvious similarity with other expedient flake tools from Archaic levels at 31Ch8 and 31Ch29, this artifact is notable only as an example of prehistoric stone-working capabilities, whereby FBRs of 1500-2500 mm^2 surface area were consistently produced with small platforms, as in this instance, of only $8mm^2$.

Lamella 10 — Middle Archaic

Eight lithic tools or fragments constitute the Archaic assemblage sampled from lamella 10 in EU3, Block B, 31Ch8. Several are potentially diagnostic forms, including two broken hafted bifaces and a drill, or third hafted biface fragment.

I. Personal Gear includes the three biface forms mentioned, plus two whole and one fragmentary, non-hafted bifacial implements.

Hafted Bifaces: specimen 3·4·28·3 is the haft element and lower blade portion of a typical Morrow Mt. II variety point (Coe 1964:37). A widespread artifact type in the Piedmont, Morrow Mt. points serve as commonly-recognized horizon markers for Middle Archaic occupations (Chapter 3). The stratigraphic position of 3·4·28·3 at an elevation of 98.62m in the 31Ch8 profile generally correlates with Morrow Mt. assemblages defined at 31Ch29. The superposition of this artifact style (see below) above a stratum containing probable Kirk or Stanly forms brings into question the existence of intervening Morrow Mt. I occupations such as defined at the Doerschuk site (Coe 1964:37). The small excavated sample at 31Ch8, of course, limits this argument, but the more extensive excavations at 31Ch29 likewise failed to produce substantial evidence for definable Morrow Mt. I occupation zones.

Hafted biface 3·7·29·6 also conforms roughly with published descriptions for Morrow Mt. II point forms. It has a contracting stem, pronounced shoulders and roughly triangular blade shape. Unlike more typical forms, the specimen has a straight base, 11mm wide, and is fairly large in overall dimensions — shoulder width of 38mm and projected length of 70-75mm. Artifact 3·7·29·6 remains within or slightly above the metric ranges for Morrow Mt. II points provided by Coe (1964:37) for the Doerschuk sample. In terms of maintenance strategies, the lamella 10 specimen may represent an early stage of manufacture and use of Morrow Mt.-type hafted bifaces. Retention of the original flake blank surface, lack of pronounced edge attrition and the major transverse blade break that led to discard support the preferred argument. Alternatively, of course, is the idea that 3·7·29·6 is merely a variation on a general Morrow Mt. stylistic theme or some previously unrecognized Piedmont point form.

Drill: specimen 3·2·29·3 is the medial portion of a expanded stem drill or perforator. Wear patterns on remaining flake scars and edges are less pronounced than for the lamella 10 example (3·1·32·4), indicating a less advanced stage of attrition or, at least, penetration into less resistant objects. The artifact blade or bit is biconvex in cross-section, averages 12mm in width and has a mean edge angle of 76.0 degrees. Despite its fragmented state, 3·2·29·3 conforms to published descriptions of similar Middle Archaic examples from elsewhere in the Piedmont and Southeast (Coe 1964:52; Lewis and Lewis 1961:59-61).

Bifaces: three examples of this tool category were found in lamella 10. Item 3·2·29·4 is a whole specimen, 3·6·30·6 and 3·9·30·11 articulate to form another complete biface and 3·4·30·3 is a miscellaneous fragment. The first biface is a characteristic discoidal biface/core, discarded at a final stage of the flake removal/reduction cycle. A series of large invasive scars extend from edges on both dorsal and ventral surfaces; other edge damage attributable to cutting or scraping activities is present as well. Dimensions of the tool include: width — 33mm; length — 43mm; thickness — 13mm; mean edge angle — 66 degrees.

The reassembled biface 3·6·30·6/3·9·30·11 is a thin (7mm), asymmetric tool, broken transversely across the midpoint of the blade. Removal of a broad, thin flake (18 x 24mm)

across the breadth of the tool thinned and undoubtedly weakened it, resulting in its eventual breakage and discard. Other measurements include: total length — 62mm; maximum width — 32mm.

The biface fragment 3·4·30·3 is a miscellaneous edge fragment 10mm thick. Several flake scar remnants permit its identification, in addition to edge rounding and other signs of attrition. Intersection of the tool edge and breakage plane form a projection (angle = 70°) used as an expedient graving or boring implement.

II. Situational Gear:

Retouched flakes: two items from lamella 10 may be classified as expedient tools. Both are unifacially modified flakes having limited areas of edge modification and damage. Tool 3·4·29·1 is a small primary flake fragment, 21 x 36 x 10mm, and 3·4·30·2 is a massive primary flake measuring 77 x 73 x 28mm.

Lamella 9 — Middle Archaic

Temporal identification of this stratum was based on stratigraphic position rather than artifact inclusions. A very limited set of expedient tools or fragments was recovered.

I. Personal Gear:

Biface Fragment: one biface fragment, 3·9·27·2, was found in lamella 9. Ten flake scars or remnants are evident on the tool faces and some edge damage is present. No functional interpretations will be proffered. The piece is 27mm wide and 9mm thick.

II. Situational Gear like the previous category, was virtually absent in the stratum sample.

Edge-damaged flakes: tools numbered 3·4·28·2 and 3·2·29·2 are primary flakes with utilized edges totalling 33 and 84 mm, respectively. Both are triangular in outline and show no intentional modification.

The third example, 3·5·27·1, is a composite tool, including two adjacent utilized edges, 21 and 13mm in length. A projection 5mm long, tapering from 6 to .5mm in width, is formed by intersection of those two edges and has been used casually as a boring or graving implement.

Lamella 8 — Middle Archaic

This stratum produced evidence for a third definite and sequential Middle Archaic occupation of the area designated 31Ch8. The sample of tools found in lamella 8 is notable also because it contains only bifacial implements — no items meeting the definitional criteria for expedient, situational forms were recovered.

I. Personal Gear: Eight artifacts were found in lamella 8 and all are assignable to this organizational category. Four are potentially diagnostic hafted bifaces, illustrating progressive stages of biface reduction and discard states. The others (four) possibly represent points on the same continua, but cannot be assigned to Middle Archaic contexts except by association with the more definitive forms.

Hafted Bifaces: Specimens 3·6·24·7, 3·7·25·1, 3·6·24·3 and 3·5·24·2 are typical Morrow Mt. type biface forms. The latter artifact morphologically resembles Coe's Morrow Mt. I variant (1964:37), with a less tightly constrained set of attributes governing production of: 1) blade outline; 2) haft elements; and 3) general symmetry and flaking control (Plate 21). The ventral surface and platform of the initial flake blank were still present at point of loss or discard, however, indicating that this probably represents a primary stage bifacial tool rather than a legitimate hafted biface type specimen.

Broken tangs characterize tools numbered 3·7·25·1 and 3·6·24·3, while 3·6·24·7 is unbroken; all are identifiable as Morrow Mt. II variants (Coe 1964:37) (Plate 21). Loss of the extreme proximal portions of Morrow Mt. point haft elements seems to be a common phenomenon within the 31Ch29/8 assemblages, indicating a recurrent design weakness in those forms, emphasized by repeated failure under functional stresses of cutting or piercing activities. Coe (1964:37) noted that shortening of this tool element on Doerschuk specimens was due to "reworking or resharpening." Repair of failed Morrow Mt. haft elements thus appears to be independently corroborated by other Piedmont samples. Furthermore, a real percentage of the small biface fragments otherwise identified as "miscellaneous point fragments" in this report and elsewhere may actually be the proximal (not distal) ends of Morrow Mt. points.

Selected measures for hafted bifaces from lamella 8 are tabulated below:

Specimen	Axial Length	Blade Length	Width ½ up Blade	Shoulder Width	Tang Width	Thickness
3·5·24·2	60mm	52	22	28	20	9
3·6·24·7	48	37	17	25	13	9
3·7·25·1	46+	40	20	24	14	9
3·6·24·3	44+	39+	14	22	14	8

If, in fact, these artifacts can be assumed to represent a larger biface technological system, then the recorded data are informative on several levels. Proceeding from initial (3·5·24·2) to whole (3·6·24·7) specimens we can observe significant reductions in all dimensions except thickness, probably reflecting bifacial "finishing" techniques. The two broken points resemble the complete one on all measurements (except 3·6·24·3, which has obvi-

ously reduced, resharpened blade and shoulder elements). Loss of the contracting tang of Morrow Mt. points may thus be cited as one variable affecting discard of Middle Archaic bifacial implements.

Bifaces: Two additional bifaces from lamella 8 have lanceolate outlines consistent with Middle Archaic patterns of tool production. Specimen 3·9·25·3 (Plate 21) is thin (10mm) and has a regularized outline but shows no modifications for hafting such as a stem or notches. It may well "fit" into the hafted biface production model discussed above and at least performed similar functions of cutting or light scraping. Other dimensions include: axial length — 57mm; maximum width — 29mm. Specimen 3·5·24·5, like 3·5·24·2, retains the original flake blank platform but on the proximal rather than distal end. Edge attrition is observable on sinuous lateral edges but purposeful edge rejuvenation and/or thinning of the piece was hampered by hinge-type flake terminations which produced "humps" on either tool face. Maximum thickness of 17mm mirrors that situation. Length is 70mm and width 26mm which generally conform to Middle Archaic parameters.

Biface 3·8·25·2 is a large, thick piece (45 x 62 x 26mm) characteristic of portable bifacial core tools discussed for 31Ch29 (see lamella 13/14-Block A). Several percussive blows resulted in the removal of a radial series of flakes from the perimeter of 3·8·25·2, prior to incidental cutting/scraping usage and discard.

The final bifacial tool from this stratum is a miscellaneous fragment 24mm wide and 13mm thick. Edge damage on 3·8·24·9 indicates use as a heavy-duty cutting implement.

Lamella 7 — Middle Archaic

A total of four recognizable tools make up the sample from this stratum of 31Ch8. A single Morrow Mt. variety hafted biface permits assignment of a least part of this occupation to that temporal phase of 6000-7000 B.P. (Chapter 3). Other tool types found are a large bifacial core and two edge-damaged or marginally retouched flakes.

I. Personal Gear:

Hafted Bifaces: the single representative of this category (3·1·21·2) is a typical Morrow Mt. II variety. It is unbroken, but otherwise is almost identical morphologically to the point 3·7·25·1 found in the underlying stratum. Both have broad blade elements, tapering abruptly to apiculate distal ends. Rounded shoulders merging with a tapering stem complete a generalized description of the tool morphology. Metric dimensions are as follows:

Attribute	mm
Axial length	58
Blade length	42
Width ½ up Blade	21
Shoulder Width	26
Tang Width	15
Thickness	10

Comparison with the lamella 8 specimens above confirms the uniformity present in design elements for Morrow Mt. point forms. Piedmont specimens from a large geographic area (Coe 1964) and successive occupations of single sites (this report) were made within apparently quite narrow parameters of breakage and/or non-suitability for continued maintenance.

Bifaces: the large bifacial core from this level is made from a coarse-grained andesitic porphyry commonly selected for production of larger Middle and Late Archaic tools in the Piedmont (Claflin 1931; Coe 1964; Turnbaugh 1975; Cook 1976). Specimen 3·2·21·4 is broken, but overall dimensions of 61 x 92 x 36mm distinguish it as one of the largest tools found at the Haw River sites. Battered edges, especially at the points of intersecting flake scars attest to its use as chopping or cleaving tool in addition to the object's primary function as a source for flake blanks.

II. Situational Gear:

Retouched Flakes: artifacts 3·8·22·2 and 3·6·22·1 are both large crescentic flake tools with minor amounts of edge modification and utilization. Neither appears to have been derived from the core described previously although they are of a similar raw material. The outline of both items is attributable to breakage, probably unintentional, along the longitudinal axes from platforms to distal ends. The left internal dorsal surface of 3·6·22·1 has had two flakes removed and shows some rounding and edge abrasion.

The second artifact (3·8·22·2) has a more uniform retouch and utilization pattern along a 48mm section of the distal and right lateral dorsal edges. Dimensions are as follows:

Specimen	Length	Width	Thickness
3·6·22·1	84mm	49	17
3·8·22·2	68mm	32	12

Lamella 6 — Middle (?) Archaic

Average elevation of this stratum is 99.0m, above the general plane of occupation floors described for 31Ch29 some 500m distant, but 20 to 30cm below occupation floors defined at the adjacent Block C excavations, 31Ch8. The artifact sample from lamella 6 consists of four whole or fragmented bifacial tools and a single edge-damaged flake.

I. Personal Gear: most tools from this stratum adhere to the definition of curated, maintained bifacial implements.

Hafted Biface: artifact 3·1·20·1 is a narrow, contracted base projectile point/knife 65mm in length and 28mm wide at the shoulders. Blade profile is a long isosceles triangle and blade length constitutes 81.5 percent of the total artifact length. Blade edges are regularized, notably by a distinctive pattern of collateral flaking on one (but not the reverse) face which has produced a pronounced medial ridge. Blade cross-section is biconvex to nearly bevelled. Maximum thickness is 9mm, tang length and width are 12mm and 11mm, respectively. Equivalent measurements for Morrow Mt. points from lamellae 8 and 9 (above) are consistently smaller for blade attributes, although haft element dimensions are similar to this specimen. While it may be a variation of a general Morrow Mt. stylistic-technological theme, this artifact also shares similarities with forms to be described from Block C, 31Ch8 proveniences associated with more typical Late Archaic assemblages.

Bifaces: three fragmented bifacial tools were excavated from this stratum. Specimen 3·6·20·2 is a transversely snapped symmetrical piece resembling bifaces from lamella 8. The second, 3·1·19·1, is a broad, thin proximal fragment showing extensive attrition on all edges. Series of broad, thin flake removals from both faces of the tool mimic reduction techniques common to Late Archaic Savannah River biface varieties. The specimen from Block B excavations is broken transversely, as is the third biface example (3·1·21·1). Thicker and "cruder" than the other biface fragments, this last example has a total of 36mm of utilization damage along two adjacent edges. Dimensions of the three fragments follow:

Specimen	Max. Width	Max. Thickness	Mean Edge Angle
3·6·20·2	26mm	10mm	59.3°
3·1·19·1	48mm	11mm	38.3°
3·1·21·1	50mm	15mm	74.4°

II. Situational Gear:

Edge-damaged Flake: a single expedient flake tool (3·4·21·5) was found in lamella 6 deposits. It measures 58 x 30mm and is 16mm thick. Edge damage is confined to a 35mm portion of the distal edge.

Lamella 5

Two tools were found in this stratum, a miscellaneous biface fragment and an anomalous hafted biface type.

I. Personal Gear:

Hafted Biface: the sole representative of this artifact category is the major portion of a "classic" Kirk Corner-notched variety projectile point (Coe 1964:69-70). Its presence in this level of 31Ch8 deposits can only be a result of "scavenging behavior." General dimensions of 3·5·17·1 are:

	mm
Axial length (projected)	53
Shoulder width	34
Tang width	18
Base width	23
Notch length	$\bar{x}$ = 10

The specimen conforms to published descriptions for an Early Archaic Kirk variety, and is noteworthy also because of an apparent lack of analogous forms in proper stratigraphic contexts at 31Ch8.

Biface: one miscellaneous biface fragment (3·4·18·1) was found in association with the hafted biface described above. It may be the proximal portion of a broad (41mm), thin (7mm) knife or preform. Attritional scars on remaining blade edges support the former interpretation.

Lamella 4 — Late Archaic

The final natural stratum described for Block B, 31Ch8 excavations consisted of a 20-25cm thick sand layer, situated between elevations of 99.20 and 99.35 meters. A typical Late Archaic Savannah River Stemmed biface allows temporal identification of the stratum contents (also see comparable level descriptions for Block C, 31Ch8).

I. Personal Gear:

Hafted Bifaces: the Savannah River Stemmed biface example (3·2·15·1) conforms to published morphological descriptions of Coe (1964:44-45) and others. Axial length of the specimen is 91mm; tang width equals 17mm; basal width is 14mm; and shoulder width is 27mm. A blade width-to-thickness ratio of 2.9:1 is dissimilar to the Doerschuk site sample average of 10:1 (Coe 1964:44) but can be explained easily as the result of several episodes of blade rejuvenation.

A second hafted biface was found in association with the Savannah River artifact, slightly higher in the excavation profile, but within the same natural stratum. Specimen

3·1·13·1 (Plate 21) is a small, stemmed hafted biface analogous in general morphology to other Late Archaic or Early Woodland forms described from the Block C strata. Measurements are as follows:

	mm
Axial length	38
Shoulder width	19
Tang length	10
Tang width	12
Base width	11
Thickness	9

Biface: one massive biface was found, made of a characteristic Late Archaic raw material (andesitic felsite). Specimen 3·7·14·1 measures 71 x 82 x 26mm and weighs 241 gm. Removal of 16 large flakes from the margins of flat river cobble produced this tool, which may be better characterized as an expedient chopper-like tool rather than as an item of curated personal equipment.

BLOCK C – 31CH8

In order to maintain descriptive and analytic continuity with other data presented in this chapter, the Block C, 31Ch8 strata and assemblages will be presented beginning with the lowest excavation levels. The natural strata recognized within Block C thus show a temporal and cultural progression of artifacts from Late Archaic through Woodland stages (Chapter 3).

Lamella 5 – Middle/Late Archaic

At an average elevation of 99.15 m and some 65 cm below the ground surface at 31Ch8, our excavations revealed a fifth natural stratum within the Block C boundaries. It was generally visible only in EU7 of Block C, where three arbitrary 5 cm levels were removed below the nine levels excavated in all other EUs. Lamella 5 is elevationally continuous with the stratum similarly numbered and described for EU3, Block B of 31Ch8, and with the fourth level described below, providing comparable data necessary for linking the two areas of site deposits.

I. *Personal Gear* consists of a single artifact of Lamella 5 deposits dug in Block C.

Hafted Biface: artifact 3·7·5·12 is a side-notched or expanded-stem variety of hafted bifacial tool which adheres to the published description for Halifax side-notched points of the Roanoke River basin (Coe 1964:108-110). Radiocarbon samples obtained by combining

fill from several hearths associated with Halifax points at the Gaston site (31HX7) produced dates of 4280±350B.P.(M-522) and 5440±350B.P.(M-523) for those occupational levels (Coe 1964:99, 118). No such information is available for the Haw River specimen but acceptable cross-comparison of attributes permits identification of 3·7·5·12 as a representative of that Middle or Late Archaic variety (see also Holland 1955:169-171 and Holland 1970:87).

Dimensions of the specimen, which exhibits characteristic grinding of the base and side-notches, are as follows:

Element	mm
Axial length	43
Blade length	30
Tang length	13
Max. Thickness	10
Shoulder Width	21
Tang Width	15
Base Width	19

Lamella 4 — Late Archaic/Early Woodland

As anticipated, several temporally and culturally distinct occupations are represented by artifacts in this stratum. Lithic artifact forms include small, stemmed points (7), broad-bladed Savannah River Stemmed knives (4), several varieties of unhafted bifaces and fragments and 20 expediently-produced flake tools.

I. Personal Gear includes 12 complete and 10 fragmented hafted bifaces and 18 whole or broken bifaces of various morphological configurations.

Hafted Bifaces have been identified as three separate groups which generally conform to established types with significance as cultural-historical markers.

1. Savannah River Stemmed — Claflin (1931) first recognized this common Late Archaic knife or projectile point type. Later investigations cited by Coe (1964: 45), and including his reports, have confirmed these large, broad-bladed, stemmed points as a recognizable and important technological element of Late Archaic assemblages throughout eastern North America (cf. Turnbaugh 1975 and Cook 1976). Three specimens were found in Lamella 4 deposits of Block B in association with a variety of other tool forms. Metric data on the Savannah River stemmed points (Plates 22:9, 10, 11) are presented below:

Specimen	Axial Length*	Blade Length*	Tang Length	Max. Width	Shoulder Width	Tang Width	Base Width	Max. Thickness
3·8·7·2	105mm	85	20	42	42	22	20	11
9·4·8·3	100	81	10	38	34	18	17	10
9·6·7·2	130	111	19	48	43	20	17	11
	$\bar{x}$=111.7	$\bar{x}$=92.3	$\bar{x}$=19.3	$\bar{x}$=42.7	$\bar{x}$=39.7	$\bar{x}$=20	$\bar{x}$=18.0	$\bar{x}$=10.7
	x=16.1	s=16.3	s=.58	s=5.0	s=4.9	s=2.0	s=1.7	s=.58

*projected measurements

The summarized data are instructive on several counts, despite the small sample size. Not unexpectedly, given the findings of other researchers, there are real uniformities among comparable dimensions. With the possible exception of blade length measurements, which had to be estimated due to breakage (Plate 22), other tool elements cluster significantly around mean values.

Savannah River Stemmed bifaces have been recovered from surface collected sites throughout the Jordan Reservoir area. Smith (1965:75-84) analyzed over 500 specimens from sites in Chatham, Durham and Orange Counties, eventually defining 15 varieties of the more-inclusive Savannah River type (Coe 1964:44-45). Groupings were made according to perceived differences in measurements such as total length and width and configuration of haft elements. Little consideration was given to equally obvious similarities between varieties attributable to life-history conditions or patterns of breakage.

Blade breakage patterns, blade outlines and edge damage patterns do provide evidence for functional roles played by these implements. All the Lamella 4 examples are missing the distal blade extremities due to transverse, snapping fractures. For Specimen 9·6·7·2 this amounts to perhaps 30 percent of the total blade. Recurvate blade edge outlines on that tool and 9·4·8·3 attest to re-sharpening of blades from at least the shoulder to two-thirds up the total blade length. Removal of tertiary thinning or resharpening flakes on Specimen 3·8·7·2 is not as pronounced, but like the other tools, it shows uniform rounding and minor polishing of lateral edges.

Manufacturing trajectories of Savannah River Stemmed points also can be defined using 31Ch8 data. Several bifaces (6·8·7·1, 6·5·7·2, 9·4·6·3 and 9·8·8·1) from Lamellae 3 and 4 are whole or fragmentary early stage Savannah River points, whose completion or further modification were interrupted by breakage or other factors. Comparisons of those specimens with the more diagnostic forms will be made in following paragraphs.

Two fragments (8·3·8·2 and 8·3·6·5) of a crude stemmed point were found in this stratum of 31Ch8. Pronounced attrition in the forms of edge step fractures and rounding, damage to the shoulders and tang and eventual transverse fracturing of the blade led to discard of this point. Cultural-historical identification of the specimen was made initially from the configuration of the proximal fragment 8·3·8·2 and only later in the analysis process was it reunited with the distal fragment (8·3·6·5). Initial classification placed it in a Morrow Mt. category, but examination of the reassembled specimen permits a more reasonable identification as an asymmetrical, heavily-damaged Savannah River Stemmed variant.

Attribute measures for the entire point were not included in the preceding table due to the reassembly problem, but are presented below:

	mm
Axial length	66
Blade length	58
Tang length	8
Max. Width	33
Shoulder Width	33
Tang Width	19
Base Width	15
Max. Thickness	11

Haft element (except tang length) and maximum thickness measures show obvious similarities with the Savannah River series; other attributes subject to breakage and reduction (especially blade dimensions) are uniformly below those ranges and support an argument for advanced stage usage and discard for specimen 8·3·8·2/8·3·6·5. Additional insight is thus gained into Late Archaic biface maintenance patterns and disposal patterns. Breakage of distal ends of points (3·8·7·2, 9·4·8·3, 9·6·7·2) conditioned immediate discard with no evident attempts to salvage such tools. Conversely, non-breakage permitted sequential reductions of axial length, blade width and length, producing smaller, often asymmetrical variants of Savannah River Stemmed points like 8·3·8·2.

2. Small Stemmed: seven hafted bifaces, or 50 percent of the total number of the potentially diagnostic examples from this stratum, constitute the category small stemmed (Plate 20.17-20). Two large-bladed artifacts (6·4·9·1 and 9·8·7·1) were grouped with this category, but general characteristics include: 1) reduced blade dimensions considerably below the range of Savannah River Stemmed points; 2) ovate to contracting-ovate blade outlines; 3) obtuse-circular blade to haft element junctures; and 4) small rudimentary or contracting tang elements.

Available dimensions for the seven points are listed in Table 9.41; the two larger specimens which lack tang elements are marked with asterisks:

Obvious morphological characteristics of blade and base outlines give the initial impression that these artifacts are Morrow Mt. II variety points. Dimensions provided by Coe for a sample of 16 Morrow Mt. II points from the Doerschuk site yielded average (axial) length and (maximum) width figures of 60mm and 20mm, respectively (Coe 1964:37). Several Morrow Mt. II points were collected from the surface of the Gaston site; at least 178 from the surface of the Hardaway site, 16 being excavated from the upper levels, but no information has been published on the dimensional attributes of those specimens (Coe 1964:63, 108). The figures that are given exceed comparable measures of the Small Stemmed 31Ch8 artifacts by over 3 standard deviations for length, while width measurements show little variation.

Based on his interpretations of artifact provenience data from the Doerschuk site, Coe admitted some confusion over the distribution of Morrow Mt. II points, noting that (1964:43):

> Their presence in later zones may have been the result of intrusive disturbances or it may indicate that this form was transitional and survived to a later date. Evidence from other sites in the area supports the latter interpretation.

While the "evidence from other sites" remains unpresented, stratigraphic information from the Lamella 4 occupation zone of 31Ch8 provides very real confirmation for this phenomenon. Specimens found here (in association with Late Archaic tools) and at other sites in the Southeast in Late Archaic or Early Woodland contexts clearly demonstrate the "survival" of small, contracting-stemmed point styles well beyond Middle Archaic times of 7000-6000 B.P.

Perhaps the best illustration of this case is found at the Camp Creek site in eastern Tennessee (Lewis and Kneberg 1957). The substantial Woodland component(s) of the site produced a variety of triangular projectile points (Greeneville, Nolichucky, Hamilton) as well as a number (69) of stemmed points classified as *Bradley Spike* (Kneberg 1956), *Rudimentary stemmed* and *straight short-stemmed* variants (Lewis and Kneberg 1957:22,24). The authors noted similarities between those latter specimens and samples from other Early Woodland and Archaic sites in eastern and western Tennessee. Confirmation of an Early Woodland date for the Camp Creek specimens was provided by four straight stemmed variant points found in the chest cavity and embedded in the left humerus of burial L3 and associated with other typical Early Woodland artifacts (Lewis and Kneberg 1957:37).

Table 9.41
Metric data for small stemmed points, lamella 4

Specimen	Axial Length (mm)	Blade Length (mm)	Tang Length (mm)	Max. Width (mm)	Shoulder Width (mm)	Tang Width (mm)	Base Width (mm)	Max. Thickness (mm)
2·5·8·2	49	23	15	20	20	20		8
3·1·9·3	45	38	7	19	19	10		8
3·1·9·4	40	27	13	19	19	11		6
4·3·9·1	40		15	20	20	12		8
8·6·6·3			9	21	21	15	14	8
*6·4·9·1	>72			23	23	14		9
*9·8·7·1	>50	49		25	25	17		10
n =	4	3	5	7	7	7	1	7
$\overline{x}$ =	43.5	37.0	11.8	21.0	21.0	14.1		8.1
s =	4.36	9.20	3.43	2.24	2.24	3.53		1.13

While the sample discussed here from Lamella 4 contexts contains only contracting-stemmed points, their identification as Late Archaic or Early Woodland, rather than Middle Archaic Morrow Mt. varieties, seems warranted. Small stemmed points also occur in 31Ch8 deposits overlying Lamella 4 and will be discussed in following assemblage descriptions.

3. Bradley Spike: a single example of a thick, stemmed projectile point or possible drill was found in Lamella 4 which conforms to published type descriptions for Bradley Spike variety points (Kneberg 1956:27; Cambron and Hulse 1964:A-12). Cognizant of the dangers of single specimen identifications, the association of this artifact with other Early Woodland stemmed points does strengthen the argument (cf. Lewis and Kneberg 1957). Bradley Spike points have been recognized as minor elements of Early Woodland assemblages from Virginia and the North Carolina Blue Ridge (Holland 1970:85; Keel 1976:126).

Distinguishing characteristics of the type manifested by Specimen 1·2·6·2 include: a narrow, triangular blade outline; straight to converging stem; thick biconvex to triangular blade cross-section; prominent medial ridges on one or both faces; and, generally crude workmanship. Dimensions of the Haw River specimen are as follows:

Attribute	mm
Axial length	>42
Blade length	>29
Tang length	13
Max. width	18
Shoulder width	18
Tang width	14
Base width	11
Max. Thickness	12

The overall appearance is that of a thick, narrow, stemmed point with extensive resharpening of the lateral blade margins. Several factors like the medial ridge effect, triangular cross-section and extreme edge angles ($\bar{x} = 74.8°$) would seem to indicate that this is merely a resharpened, broken and discarded variant of another Late Archaic or Woodland point style present in the same occupation zone. However, the thickness of the point (12 mm) exceeds similar measures for both Savannah River and other varieties from Lamella 4 and in combination with other measured attributes renders the latter interpretation unlikely.

Hafted Biface Fragments: seven fragments of what were judged to be hafted bifaces were collected from Lamella 4 of Block C. Absence of haft elements or other diagnostic attribute combinations prevents further classification of such specimens into cultural-historical types. The Lamella 4 specimens involve at least three types of blade breakage distributed as follows:

Specimen	Break type Most Distal	Snapped Tip	Transverse Break
4·7·8·3			X
1·1·8·1		X	
4·2·8·2			X
8·2·7·7			X
9·3·7·1		X	
2·3·8·1	X		X
6·9·8·10		X	
9·7·6·1	X		X
Total	2	3	5

The distribution of breakage patterns is thus divided between snapped tips or transverse breaks of distal point extremities. Combination of two patterns for artifact fragments 9·7·6·1 and 2·3·8·1 denotes their appearance as medial blade portions.

Bifaces: a total of 15 whole or broken bifaces were excavated from Lamella 4 of Block C, including five whole examples, five distal and five proximal fragments. Only two fragments (8·7·7·5 and 8·7·7·1), from the same level and 1m x 1m square, could be re-assembled into an entire biface. A variety of tools are represented in the biface sample, including portions of probable Late Archaic hafted bifaces (9·8·8·1 and 9·4·6·3); other whole or broken specimens represented various bifacial knife, core or preform categories. All bifaces from this occupation zone were made of meta-igneous rocks, mirroring the total lack of quartz utilization in this Late Archaic/Early Woodland zone. Two additional bifacial tools are described separately below.

Table 9.42 persents nominal and metric data on Lamella 4 bifacial tools. In keeping with previous biface categorizations, they are segregated by relative states of reduction and/or determined usages.

Data included on Table 9.42 suggests that bifaces categorized as "Immediate Manufacture" types were generally larger than those grouped within the second, and possibly

Table 9.42
Data on Bifaces From Lamella 4 Occupations 31Ch8

Biface Category	Condition	Shape	Length (mm)	Width (mm)	Thickness (mm)	Av. Edge Angle	Edge Polish?
Immediate Manufacture							
8·9·6·1	whole	ovate	69	51	26	80.5	
8·7·7·1/ 8·7·7·5	whole (reassem.)	triangular	79	33	18	72.0	
8·3·9·4	whole	ovate	53	27	14	67.5	
9·8·6·4	whole	ovate	49	28	15	77.0	
Intermediate							
3·1·9·2	whole	ovate	63	30	11	62.0	X
3·1·9·1	dist. frag.			33	11	64.5	
1·4·6·1	dist. frag.			22	11	71.0	X
8·1·8·3	dist. frag.	ovate?		30	8		
8·8·9·1	dist. frag.	ovate		36	9	57.3	X
9·8·8·1	dist. frag.	triangular		35	11	56.2	X
1·1·7·1	prox. frag.	ovate		24	12	60.0	X
3·8·8·2	prox. frag.	ovate		41	9		
6·1·8·2	prox. frag.	rectangular		30	12	61.0	
9·4·6·3	prox. frag.	ovate		46	12	42.0	
9·6·8·2	lat. frag.				9		
Core/ Chopper							
9·4·6·2	whole	rectangular	76	112	48	65.0	
Adze							
9·8·6·5	whole	ovate/ triangular	79	42	19	69.0	X

sequential, "Intermediate Manufacture" group. Obvious differences between the two include a tendency for Intermediate bifaces to have more regularized ovate outlines, smaller dimensions of width, thickness and edge angles (Table 9.42).

In order to statistically assess those interpretations, two sample difference of means tests were calculated for sample means of widths, thicknesses and average edge angles. Pooled variances were used to compute standard errors and the t-statistic was utilized since sample sizes were small (Chase 1967:47). The null hypothesis, that $\overline{x}_1 = \overline{x}_2$, was tested for each variable of width, thickness and average edge angle of Lamella 4 bifaces. A low t-value of .55 for width means (df = 13) indicated that the null hypothesis could not be rejected at even the .20 level. This may be interpreted to mean that no significant differences in mean widths occur between the biface samples grouped as Immediate and Intermediate Manufacture, i.e., they could represent samples of the same population of bifaces.

Computed differences of means for thickness and average edge angles indicate otherwise, however. The null hypothesis that no difference exists between the two samples ($\overline{x}_1 = \overline{x}_2$) can be rejected for both attribute mean values. The values of t for thickness (4.62, with 14 degrees of freedom) and edge angle (3.02, with df = 10) allow rejection at the .001 and $.02 < p < .01$ levels, respectively. In other words, statistically significant differences exist for thickness measures and average edge angles of the two biface samples.

Interpretation of bifaces from Early Archaic levels of 32Ch29 followed similar lines of reasoning concerning manufacture and discard stages. Biface categories were recognized according to shared attributes of form and metric dimensions. The Lamella 4 sample from 31Ch8 undoubtedly contains specimens from several occupational episodes, but again, categories of biface reduction can be identified. Artifacts classed as "Immediate Manufacture" are fairly thick ($\overline{x}$ = 18.25 mm) tools with edge angles averaging 74 degrees. Bifaces termed "Intermediate" are generally more symmetrical, thinner ($\overline{x}$ = 10.45 mm) and have reduced edge angles averaging 59.3 degrees. The latter category probably represents "finished" artifacts, more prone to breakage during use as general-purpose cutting implements, while the latter resulted from expeditious production of flakes and use as incidental cutting or scraping tools.

Core/Chopper: metric data on this large bifacial implement may be found in Table 9.42. A portion of a water-worn cobble of andesitic felsite has been modified by removal of six alternating flakes from one edge, producing a heavy, sinuous-edged tool. Moderate use damage in the form of battering and rounding of that edge attests to its use as a chopping or cleaving tool. The overall size (76 x 112 x 48 m; 448 gm) and raw material suggest that this artifact is associated with the Savannnah River occupation of 31Ch8.

Adze: specimen 9·8·6·5 is an ovate/triangular bifacial tool with a marked plano-triangular transverse cross-section. Metric dimensions for this tool are provided in Table

9.42. While some smoothing and rounding of flake scar intersections occur on all edges of this tool, most edge damage is found on the larger (distal) end of the object. Numerous step fractures along the dorsal surface indicate use as an adze-like tool. General size and raw material again suggest that this may be a Late Archaic tool type and certain similarities exist between its morphology and that of Savannah River Stemmed bifaces. Wear patterns and apparent lack of attempts to thin the biface into a more characteristic Savannah River form provide evidence to the contrary, however.

II. Situational Gear recovered from an occupation zone 4 of 31Ch8 included a variety of expedient tools identified as retouched flakes (5) and edge-damaged flake tools (11). One large, unifacially-retouched core tool also may be included in this category.

Retouched flakes: tools in this category include one tertiary and three primary flakes, retouched along their margins to produce expedient cutting or scraping implements. All are made of coarse-grained meta-igneous raw materials. Pertinent information on the Lamella 4 specimens follows.

Specimen	Length	Width	Thickness	Av. Edge Angle	No. Retouched Edges	Edge Locations
4·1·8·1	77mm	56	21	46°	1	RL
8·2·9·5	76	45	19	39	1	RL
7·6·7·1	22	39	12	58.3	2	RL, LL
8·8·8·1	58	37	11	51.3	1	RL

With the possible exception of 7·6·7·1, these artifacts may again be identified as Late Archaic tool forms, judging from their raw material and overall dimensions. Production of fairly large primary flakes (n = 3; $\overline{x}$ length = 70 mm; $\overline{x}$ width = 44 mm) which were subsequently retouched along one edge with moderate edge angles ($\overline{x}$ = 45.4) may indicate a consistent Late Archaic expedient tool form. Their association with more formalized hafted bifacial cutting tools may represent functional convergences without labor investments needed to produce and maintain the latter types.

"Plane": a massive (569 gm) chunk of andesitic felsite has been modified by removal of 3 or 4 large flakes from the dorsal surface, producing a large unifacial "plane" or adze-like tool. Dimensions of specimen 3·9·7·1 are: length — 125 mm; width — 85 mm; thickness — 43 mm. Edge angles along the distal or bit portion average 67.3 degrees. The tool cross-section is triangular and cortex covers 80-85 percent of the dorsal surface, indicating that the large flake was removed from the corner of a massive boulder or outcrop of stone. Edge damage is confined to the extreme distal portions of flake scars and consists of minor

hinge fractures and edge rounding. Low magnification (20x) reveals several striations on dorsal and ventral bit surfaces, oriented perpendicularly to the edge axis. Planing or light adzing of wood is hypothesized as the main tool function.

Edge-damaged Flakes: eleven examples of this tool category were found in Lamella 4. Table 9.43 includes descriptive and metric data on those artifacts.

Table 9.43
Edge-Damaged Flakes From Lamella 4, 31Ch8

Specimen	Length	Width	Thickness	No. Modified Edges	Edge Location	Flake Type
2·3·8·3	40mm	39mm	15mm	2	RL, LL	BCRF
3·5·7·6	50	47	5	2	RL, LL	RBR
1·2·8·2	79	28	12	3	D, P, RL	Ind.
3·5·8·1	27	17	6	1	LL	FBR
4·1·6·2	21	19	6	1	Ind.	Ind.
6·2·8·1	69	32	12	1	RL	CR
4·7·8·4	77	57	15	1	D	BCRF
8·2·7·6	61	47	7	2	RL, LL	CR
8·3·9·14	28	26	6	1	LL	Ind.
9·3·9·1	26	40	7	1	LL	DF

This category obviously contains a variety of shapes and sizes, although a few categories can be isolated. Specimens 6·2·8·1, 4·4·9·2 and 8·2·7·6 have been identified as central ridge (CR) flake types. Like examples of CR flakes from Archaic levels of 31Ch29, the specimens found here are long, parallel-sided blade-like flakes with dorsal ridges formed by two or three intersecting flake scars. Average length and width measurements for the artifacts are 70.5 mm and 35 mm, respectively, with individual length/width ratios of 2.15, 2.10 and 1.30. Edge damage on the specimens is confined almost exclusively to lateral margins, indicating their use as incidental cutting tools; no modifications of proximal or distal ends for use as endscrapers or adzing tools (see 31Ch29 descriptions) were noted.

Other artifacts from this stratum are classed as bifacial core reduction flakes (BCRF), flakes of bifacial retouch (FBR) or indeterminant (Ind.). A single example was removed from a prepared bifacial discoid core (9·3·9·1) and may evidence purposeful core preparation and flake removal techniques. One of the FBR's (3·5·7·6 — Plate 22.4) is a broad, thin flake with a typical faceted platform that may be representative of the controlled percussion-flaking techniques common to Late Archaic Savannah River technologies.

Lamella 3 — Woodland

Lithic and ceramic data from this natural stratum suggest that the majority of occupations represented in the artifact samples correspond to Early and Middle Woodland substages (see Chapter 3 for discussion). Given the rather coarse measures of strata assignments mentioned previously, it is not surprising that several distinctive varieties of projectile points, ceramics and other artifact forms were recovered from this level. Nevertheless, apparent absences of diagnostic Late Archaic and Late Woodland specimens (except as noted) do indicate that Lamella 3 deposits contain mostly earlier Woodland occupational data for 31Ch8.

I. Personal Gear includes a variety of functional and stylistically dissimilar tools produced during multiple occupations of former land surfaces, now visible as Lamella 3 deposits. Some can be assigned to categories of established cultural-historical significance, while others, including a significant portion of the hafted bifaces are unreported in the regional literature. Comparisons of those forms with artifacts found outside the North Carolina Piedmont region will be made to provide insights into their occurrences at the Haw River sites.

Hafted Bifaces: projectile points from Lamella 3 were grouped into nine categories or types based on morphological characteristics. They include: Uwharrie (1); Yadkin (1); Small Stem-notched (3); Small Lanceolate (4); Large Lanceolate (2); Contracting Stem (2); Otarre-like (4); Savannah River Stemmed (1); and Miscellaneous (2). No examples of Early Woodland Badin Crude Triangular (Coe 1964:45) were recognized in the Lamella 3 collections, nor were any found in other contexts at 31Ch8. Other named types correspond with descriptions of similar point forms found elsewhere in the Piedmont (Coe 1964; Keel 1976); others are unreported in the literature, rendering their correct identifications more problematical.

1. Uwharrie: artifact 8·8·5·2 is the basal portion of a thin, triangular arrow point. Coe's (1952:308; 1964:49, 110-111) discussions of relative dimensions of Uwharrie and Roanoke triangular points indicate that this single example from 31Ch8 could fit either description. The Uwharrie identification is preferred, however, given recovery of several other Uwharrie specimens from 31Ch8, Ch33, Ch29 and other sites in the Haw River vicinity (Smith 1965; McCormick 1970).

2. Yadkin: specimen 4·8·4·3 exhibits the broad triangular outline and concave base typical of Yadkin type arrow points (Coe 1964:45). Again, similarities with the Roanoke type are present, but the former designation is preferred. Dimensions of the 31Ch8 specimen (Plate 23.16) include: axial length — 47 mm; maximum width — 27.5 mm; thickness — 8 mm. Blade edges are straight and the "ears" and distal tip exhibit pronounced smoothing and rounding, which may mean this specimen was used for purposes other than those the label "projectile point" suggest.

3. Small Stem-notched: three artifacts were placed in this category, due to shared attributes of small size, triangular blade form, asymmetric outline, and small (almost rudimentary) stems (Plate 23.14). Manufacturing techniques involved marginal reworking of small flakes, followed by one or more instances of use, breakage or re-working prior to discard. Specimen 4·3·4·6 resembles point forms classed as Redimentary Stemmed from the Camp Creek site mentioned previously (Lewis and Kneberg 1957:21, 24), although overall dimensions and manufacturing techniques appear somewhat disparate.

   The remaining examples of this category (4·7·6·1 and 2·1·5·1) are more definitely prepared for hafting. Small tangs averaging 7.5 mm long were formed by removal of several small flakes from the proximal corners of thin flakes. Blade margins were roughly shaped by random flaking, yielding asymmetric outlines. An analogous specimen (6·8·1·2) was recovered from surficial deposits of 31Ch8, but no definite cultural-historical identification is possible. Considering their diminutive size, however, these may represent the first appearance of true arrow points in the stratigraphic record at 31Ch8.

   Dimensions of the Small Stem-notched points from Lamella 3 can be found below.

Specimen	Length	Shoulder Width	Tang Length	Tang Width	Thickness
4·3·4·6	32mm	17mm	3mm	7mm	6mm
4·7·6·1	26	17	7	9	6
2·1·5·1	28	23	8	11	6

4. Small Lanceolate: four specimens represent this category and are characterized by lanceolate to ovate outlines, absence of notching or other haft preparation and a peculiar manufacture or resharpening technique that left pronounced medial ridges on blade faces (see Plate 23.15). General appearances and manufacturing trajectories seem to differ from other Piedmont varieties, including Coe's eared Yadkin variety (1964:47, 49), although the range of variations included under that rubric has not been presented. Dimensions for the 31Ch8, Lamella 3 specimens are presented below.

Specimen	Length	Width	Thickness
2·6·5·4	43mm	17mm	7mm
2·6·5·5	47	19	9
2·6·5·6	46	13	12
7·9·6·1	57	17	12

Uniformity of shape and spatial association (three found in a single lm x lm unit, 5 cm thick) lead us to conclude that these biface forms constitute a legitimate category of Woodland projectile point or small knife. Except for the absence of haft elements, they further resemble the Rudimentary Stemmed and Small Stem/notched types found in Lamellae 4 and 2 of 31Ch8. Taken as a group, those artifacts conform to various Early Woodland categories found elsewhere in the Southeast (Lewis and Kneberg 1957), but unrecognized or virtually unpublished from Piedmont sites. Additional discussion on this topic follows in the Lamella 2 descriptions.

5. Large Lanceolate: apparently larger versions of the preceding category, these artifacts are separated here due to larger size (especially length) and evidence of resharpening on one specimen. Artifacts 2·9·7·5 and 5·3·5·1 are interpreted as hafted bifacial knives, which were part of a Woodland assemblage that included the Small Lanceolate projectile points discussed previously.

   Dimensions of the two specimens follow:

Specimen	Length	Width	Thickness
2·9·7·5	67	24	10
5·3·5·1	72	20	10

6. Contracting-stem: two Morrow Mt.-like hafted bifaces were found in Lamella 3 associated with more typical Lake Archaic and Woodland forms. Despite arguments presented earlier for survival of contracting-stem points beyond normal Middle Archaic parameters, these examples are virtually indistinguishable from the older varieties (see Block B, 31Ch8 and Block A, 31Ch29 descriptions). Dimensions are as follow:

Specimen	Length	Width	Thickness	Blade Length	Tang Length	Tang Width
2·3·7·3	56mm	22mm	10mm	42mm	14mm	14mm
6·6·5·6	52	27	10	32	20	17

   Two-sampled t-tests were computed for dimensions of tang length and tang width on the Morrow Mt. II forms from Occupation Floor 3 of 31Ch29 and the Small Stemmed points found in Lamella 4 deposits at 31Ch8. Those dimensions were selected because they were judged to be least affected by variable breakage and resharpening patterns. Degrees of freedom associated with all t-values were

ARTIFACT PROVENIENCES — PLATE 21
VARIOUS ARCHAIC TOOL FORMS, 31CH8, BLCOK B

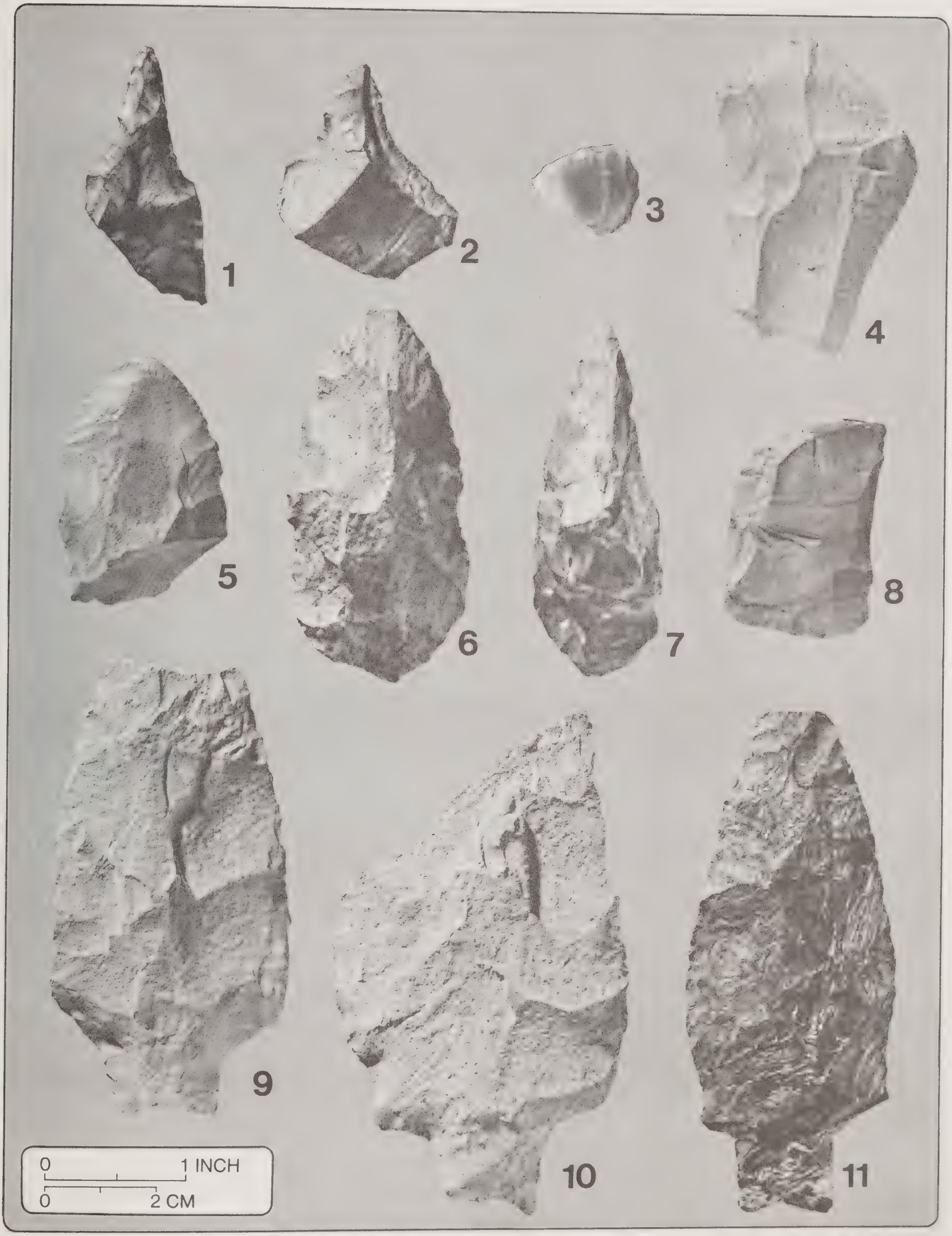
1. 3.1.13.1
2. 3.5.24.2
3. 3.9.25.3
4. 3.6.24.7
5. 3.1.31.1
6. 3.9.32.7
7. 3.5.33.2
8. 3.8.35.2
9. 3.5.40.2
10. 3.8.41.3
11. 3.9.40.3

DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
COMMONWEALTH ASSOCIATES, INC.

PLATE 21
REPRESENTATIVE STONE TOOLS, 31CH8,
BLOCK B, STRATA 4 THROUGH 15

ARTIFACT PROVENIENCES — PLATE 22
MISCELLANEOUS TOOL FORMS, 31CH8, BLOCK C

1. 7.9.1.1
2. 9.4.3.4
3. 7.4.5.4
4. 3.5.7.6
5. 1.3.4.2
6. 5.1.2.2
7. 9.3.4.2
8. 8.7.6.2
9. 3.8.7.2
10. 9.6.7.2
11. 9.4.8.3



DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
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PLATE 22
MISCELLANEOUS STONE TOOLS, 31CH8,
BLOCK C, STRATA 1-4

ARTIFACT PROVENIENCES – PLATE 23
WOODLAND PROJECTILE POINTS, 31CH8, BLOCK C

(Stratum 1)

1. 7.1.3.6
2. 4.2.1.8
3. 2.6.1.4
4. 7.9.2.1
5. 8.7.2.2
6. 7.3.3.3

(Stratum 2)

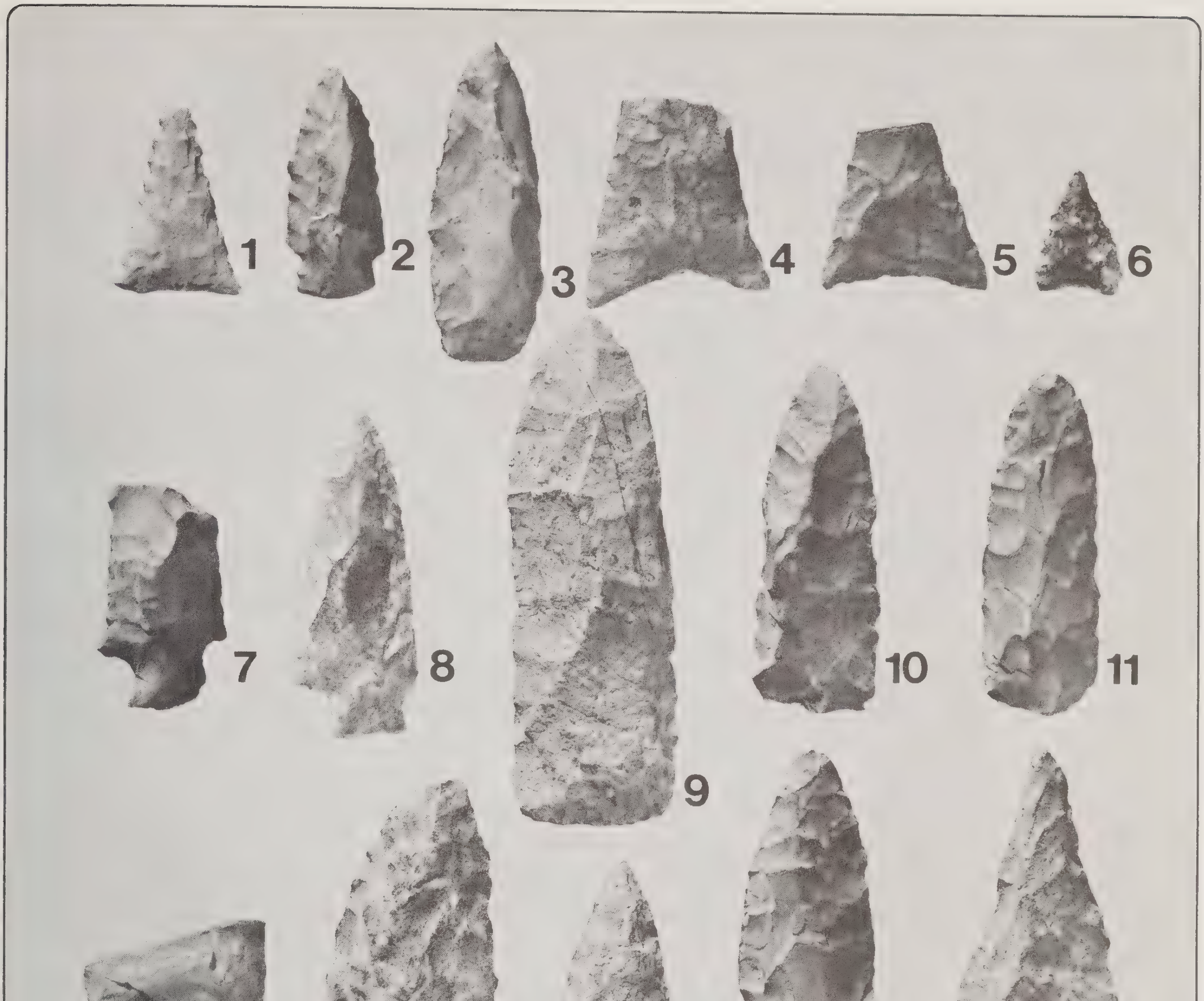
7. 1.8.3.1
8. 1.8.4.4
9. 2.7.3.1
10. 2.6.3.3
11. 2.5.4.2

(Stratum 3)

12. 6.6.4.4
13. 6.5.3.2
14. 4.5.4.6
15. 2.6.5.5
16. 4.8.4.3

(Stratum 4)

17. 4.3.9.1
18. 3.4.9.3
19. 2.5.8.2
20. 3.5.9.4



DATA RECOVERY AT SITES 31CH29 & 31CH8
B. EVERETT JORDAN DAM & LAKE
CHATHAM COUNTY, NORTH CAROLINA
COMMONWEALTH ASSOCIATES, INC.

PLATE 23
DIAGNOSTIC PROJECTILE POINTS, 31CH8,
BLOCK C, STRATA 1 THROUGH 4

approximated, following Blalock (1972:227), because of disproportionate sample sizes. Table 9.44 presents summary statistics on the three samples, followed by Table 9.45 which includes results of the Student's t-tests.

Results of the Student's t-tests included on Table 9.45 are very informative. First, based on dimensions of tang length and tang width, there are no significant differences between the two Contracting Stem points from Lamella 3, 31Ch8 and the Morrow Mt. points from Lamella 3, 31Ch29. Comparable results obtained for contracting Stem tang elements for the Lamella 3 and 4 samples from 31Ch8. Based on this evidence then, accurate separation of small samples of Contracting Stem projectile points from Middle Archaic Morrow Mt. forms will be exceedingly difficult. Discussions on other aspects of this problem occur elsewhere in this report (see Lamella 3 and 4 occupations, 31Ch29), but it appears that without benefit of stratigraphic and associational data, the correct assignment of small, contracting-stem hafted biface forms to particular cultural-historical periods must be approached with extreme caution.

7. Otarre-like: Keel (1976:194-198) has identified two variations of a general Late Archaic or Early stemmed point called Otarre and Swannanoa Stemmed. Three fragmented hafted bifaces were found in Lamella 3 deposits of 31Ch8 which may provide evidence for the occurrence of similar forms in the Piedmont (see Taylor and Smith 1978; Anderson et al. 1979). Two of the Haw River specimens, 6·5·4·5 and 6·6·4·4 (Plate 23.12), are broken immediately above the shoulders and have small, subrectangular stems. The third example, 6·5·3·2 (Plate 23.13), is nearly complete and exhibits a similar-haft element configuration, but has been subjected to several episodes of resharpening and use prior to discard. Selected available dimensions for the three artifacts are presented below:

Specimen	Length	Shoulder Width	Tang Width	Tang Length	Base Width	Thickness
6·5·3·2	42mm	24mm	19mm	11mm	20mm	8mm
6·5·4·5		22	14	8	13	10
6·6·4·4		24	18	7	15	7
	$\overline{x}$ = N/A	$\overline{x}$ = 23.3	$\overline{x}$ = 17.0	$\overline{x}$ = 8.67	$\overline{x}$ = 16.0	$\overline{x}$ = 8.33

Comparable (average dimensions for the types defined by Keel are:

	Length	Shoulder Width	Tang Width	Tang Length	Base Width	Thickness
Otarre	51.4mm	30.5mm	N/A	15.7mm	14.9mm	9.9mm
Swannanoa	32.6	19.0	N/A	11.3	12.6	N/A

Table 9.44
Summary statistics on Morrow Mt. and
Contracting Stem points from 31Ch29 and 31Ch8

	Morrow Mt. Lamella 3, Ch29			Contr. Stem Lamella 3, Ch8			Contr. Stem Lamella 4, Ch8		
	n	$\overline{x}$	s	n	$\overline{x}$	s	n	$\overline{x}$	s
Tang Width	31	14.68	2.61	2	15.5	2.12	7	14.1	3.53
Tang Length	27	13.22	3.32	2	17.0	4.24	5	11.8	3.43

Table 9.45
Student's t-tests comparing tang dimensions of Morrow Mt. and
Contracting Stem points from 31Ch28 and 31Ch8

Lamella 3, Ch29/Lamella 3, Ch8

	t-value	Probability	
Tang Width	.3902	p ⟩.20	df = 1
Tang Length	-.881	p ⟩.20	df = 1

Lamella 3, Ch8/Lamella 4, Ch8

	t-value	Probability	
Tang Width	.546	p ⟩.20	df = 4
Tang Length	1.137	p ⟩.20	dr = 2

Comparison of attributes for the three type samples indicates that the Haw River specimens tend to have broader, shorter stems than either of Keel's types' length/width indices of 54.2 (Haw sample), 105.4 (Otarre) and 89.7 (Swannanoa) show that the tang elements of the 31Ch8 specimens more closely approximate the Early Woodland Swannanoa forms than Late Archaic Otarre examples. Other attributes of length and shoulder width of Haw River examples also tend to be intermediate between the Southern Appalachian stemmed forms recognized by Keel. Again, the fragmentary and damaged nature of the 31Ch8 "Otarre-like" hafted bifaces precludes completely satisfactory categorization but, as the above figures show, certain morphological congruences may exist between them and Late Archaic or Early Woodland stemmed points found elsewhere in North Carolina. Present appearances of the three points thus necessitate a qualified "Otarre-like" identification.

8. Savannah River Stemmed: Specimen 6·6·4·3 conforms to published descriptions (Coe 1964:44-45) of the large, broad-bladed point or knife forms characteristic of Late Archaic occupations in the Piedmont. The distal end of the blade has broken along a seam of impure stone, but otherwise the tool is complete. Dimensions compare favorably with other Savannah River Stemmed points from 31Ch8. A well-made square stem and choice of latite porphyry as a raw material distinguish it from the more typical forms. Dimensions are: Length (projected) — 59 mm; shoulder width — 32 mm; tang width — 22 mm; tang length — 15 mm; maximum thickness — 9 mm.

9. Miscellaneous: the first artifact within this category is an unbroken side-notched point with concave base and excurvate blade outline. Reduction of shoulder width below the width of the "eared" base and obvious resharpening of the blade margins indicate that the tool was subjected to one or more episodes of use before loss or discard. Blade cross-section is uniformly biconvex. The inside of both shallow side-notches and the base margins have all been lightly ground. Specimen 3·1·6·1 may correspond to points labelled Halifax side-notched by Coe (1964: 108-110). As always, single specimens remain difficult to "type" in the traditional sense, due to vagaries of breakage, resharpening and the like.

   Distinguishing features of Halifax points from the Gaston site included: preponderance of quartz as raw material; base width less than shoulder width; straight basal edge and light grinding of the notches and base (Coe 1964:108-109). While the first three conditions of that identification are not met by the 31Ch8 specimen, their absence may be explained by its geographical provenience near sources of meta-volcanic stone sources and use-life factors. Variants of Woodland stage Yadkin points, as identified by Coe (1964:49), were occasionally modified by side-notches, taking on a characteristic "pointed ear" appearance. Coe also noted similarities between those point styles and Camp Creek and Nolichucky forms from Early Woodland sites in Tennessee (Lewis and Kneberg 1957). The Lamella 3 specimen more closely resembles the Middle/Late Archaic

type defined by Coe and others (Holland 1955:171) from Piedmont collections, however the overlapping and mixed Late Archaic and Woodland occupations present in Lamella 3 deposits makes the identification quite feasible.

Dimensions of Specimen 3·1·6·1 include: length — 42mm; shoulder width — 19mm; base width — 22mm; thickness —9mm.

Artifact 8·3·5·3 is a fragmented, probably burned projectile point or small knife. A vestigial stem may be present, but artifact condition precludes accurate evaluation of other tool attributes or categorization within one of the other point groups found in this stratum, such as Small Stem-notched or Otarre-like. Available dimensions are: shoulder width — 17mm; tang width — 11mm; tang (?) length — 5mm; maximum thickness — 8mm.

Biface Fragments: Lamella 3 deposits excavated within Block C yielded seven fragments of hafted bifaces. Five are thin, triangular distal tip portions and two are medial fragments. None show extensive edge wear, yet breakage patterns (transverse in all cases) indicate that these pieces resulted from activities other than use as projectile points, where distal impact fractures should have predominated.

Included in this category are specimens numbered: (distal fragments) 1·4·6·3, 4·4·5·4, 6·5·6·2, 6·1·3·1 and 3·8·5·4; (medial fragments) 2·2·7·2 and 7·4·6·2.

Bifaces: the biface category for this occupation zone includes 11 whole and 13 broken specimens. Table 9.46 presents data on the several recognized categories: discussion of those groups and possible interpretations follow the table.

To maintain consistency with biface analyses for other occupation zones of the Haw River site complex, Lamella 3 bifaces were grouped into three manufacturing categories: Immediate; Intermediate; and Tertiary. The third category was changed from the Biface/Discoid Core scheme used for 31Ch29 assemblages because forms of that description were lacking in the Lamella 3 component. The idea of progressive reduction stages for bifacial tools is retained, however, and the Tertiary class includes fairly small, thin tools or fragments that are not markedly different from other specimens called hafted bifaces.

A few bifaces may tentatively be assigned to particular cultural-historical groupings because of morphological similarities with more "diagnostic" forms. Raw material selection, size, general outline and incipient features like haft elements and flaking patterns allow specimens 6·1·5·1, 6·2·5·2, 6·8·7·1 and 6·5·7·2 to be identified as Late Archaic Savannah River tools. The first three are large, thick bifaces formed by percussion flaking techniques into "blanks" or preforms. All were rejected prior to final shaping due to the knappers' inability to remove prominent "knots" from one or both faces of the items. Specimens

Table 9.46
Data on Bifaces from Lamella 3, 31Ch8

Biface Category	Condition	Shape	Length	Width	Thickness	Weight	Edge Damage
Immediate Manufacture							
2·9·5·8	whole	ovate	96mm	59mm	29mm	161gm	X
6·2·5·5	whole	rectangular	46	30	13	52	
6·7·5·8	whole	triangular	78	60	20	85	X
5·1·4·7	broken	ovate		49	14	49	X
9·9·6·6	broken			34	16	15	
Intermediate							
6·1·5·1	whole	ovate	75	32	31	62	
6·2·5·2	whole	ovate	46	30	18	52	
6·5·6·1	whole	ovate	37	24	11	7	
6·8·7·1	whole	ovate	113	54	23	135	X
4·6·5·1	broken			26	15	18	
9·8·5·2	broken			28	13	14	
6·5·7·2	broken	ovate		46	16	61	X
Tertiary							
5·2·3·7	whole	lanceolate	77	20	8	12	X
9·3·5·1	whole	ovate	40	19	10	7	X
9·3·5·2	whole	ovate	45	28	13	14	X
8·8·5·1	whole	ovate	39	21	8	7	X
6·2·3·4	broken			20	9		
6·8·4·1	broken			34	7		
7·4·5·1	broken			17	6		X
5·2·4·3	broken	rectangular		34	14		X
5·2·4·4	broken	rectangular		44	10		X
5·3·4·6	broken	ovate		30	7		X
8·7·6·2	broken	rectangular		26	8		X
Miscellaneous							
5·1·3·1	broken				9		

6·8·7·1 and 6·5·7·2 exhibit edge damage (rounding, polishing) characteristic of use as cutting tools. The latter artifact was successfully thinned by bifacial percussion only to be broken transversely across the blade, perhaps during use. A rudimentary, square stem or haft element is present on 6·5·7·2, resembling features of more finished Savannah River stemmed points.

The tertiary manufacture category likewise contains artifacts that, except for final production of notches or stems, might have been grouped with hafted bifaces. More extensive edge damage patterns also serve to segregate these items from the more lightly used hafted biface forms. As examples, artifacts 9·3·5·1, 9·3·5·2 and 8·8·5·1 share a fairly uniform set of metric dimensions, shape and edge damage patterns, yet cannot be confidently provided with any definite cultural-temporal assignation. Except for cruder workmanship and extensive edge damage, they might be grouped with the Small Lanceolate point forms identified from the same strata (see above). The mixed cultural deposits of Lamella 3 render that a moot point, however.

A third biface variety from this stratum that deserves mention includes the proximal fragments of three rectangular knives. Unlike the Savannah River forms described above, these lack any preparation for hafting. Edge rounding on Specimens 5·2·4·3, 5·2·4·4 and 8·7·6·2 is confirned largely to the straight lateral sides; a series of small step fractures on proximal (?) edges may indicate some use as light-duty adzing or scraping tools as well, although no striations are visible on the tool faces under low-power (70-100x) magnification. All are broken, with transverse, snapped breaks as the shared pattern (Plate 22.8).

II. Situational Gear: in comparison with underlying Lamella 4 deposits and other occupation zones of the Haw River sites, expedient tool forms from Lamella 3 are an attenuated group. Only eight flake tools, three fragmented cores and a broken cobble tool were found in this stratum; together, they comprise only 20 percent of the lithic tool assemblage from all occupations of Lamella 3 surfaces.

Retouched Flakes: four marginally retouched flakes were placed in this analytic category, including one primary, two secondary and one tertiary flake. Specimens 4·1·4·5 (broken) and 4·4·5·3 are thick ovate flakes with both unifacial percussion flaking and secondary utilization damage (rounding, step fractures) present on their lateral edges. Unmodified, flat platforms are present on both tools.

The other tools in this category, 6·7·4·2 and 9·4·5·6, also retain portions of their original flake platforms, but were modified by cursory bifacial flaking along single lateral edges. Alternating bifacial flake scars produced sinuous edges needed for heavy cutting or sawing activities; crushing and rounding of flake scar intersections attest to the forces connected with such activities.

Dimensions for purposely modified flake tools from Lamella 2 are presented below.

Specimen	Length (mm)	Width (mm)	Thickness (mm)	Av. Edge Angle	No. Modified Edges	Edge Locations
4·1·4·5		41	10	66.6	1	RL
4·4·5·3	76	46	19	73.4	2	RL, LL
6·7·4·2	63	32	14	77.3	1	LL
9·4·5·6	46	27	12	77.8	1	RL

Edge-damaged Flakes: again, only four artifacts assignable to this expedient tool category were found in Lamella 3. Two large core reduction flakes, an FBR and a sharp-pointed "graver," are included. Specimen 2·8·7·4 is a massive, broken flake of andesitic felsite which shows rounding and polish along one acutely-angled ($\overline{x}$ = 51°) lateral margin and a number of battering-type step fractures along edges of the steep-angled ($\overline{x}$ = 77°) fracture plane. Specimen 8·2·5·4 retains original cortex on its dorsal surface and is made of flow-banded felsite. One edge, 104 mm in length, shows evidence of short-term utilization in the form of small nibbling-type flake removals.

One utilized FBR was found in Lamella 3, with typical multi-faceted platform and thin cross-section. Edge damage was confined to an area 26 mm in length along the distal hinge flake termination. The final tool in this category was originally identified as miscellaneous piece of debitage, but on re-examination proved to be an expedient graving or boring implement. The intersection of the ventral flake surface and two dorsal flake scars had produced a sharp point (46°), which on close inspection showed signs of rounding, polish and two minute flake scars. Short-term use as a graving or boring tool is suggested.

Cores: three fragmented cores were found in Lamella 3 deposits. One (9·2·5·4) is an angular chunk of dark meta-igneous stone with patinated surfaces which has been scavenged and re-utilized for additional flake production (2 instances) and as an incidental scraping/boring implement (see above). Recovery and re-use of older cultural debris by prehistoric groups is no doubt a common occurrence (although hard to document); other occupation floors from the Haw River sites also contain evidence for similar behavior at locations quite near adequate supplies of raw materials.

The second example of this artifact category is more easily recognizable as a core. Artifact 5·6·1·12 is a fragmented cobble of pure crystalline quartz from which numerous flakes were derived. This core can best be described as multi-directional, since no more than two or three flake removals shared a common platform surface. The reasons for discard of this specimen are problematic since it obviously represents a potential source for crypto-crystalline material of the highest quality. It would appear that adequate surfaces remain for additional flake production, without resorting to a relatively inefficient method like bipolar

percussion (see below). Specimen 5·6·1·12 may represent a curated, rather than expedient, artifact form, although similar cobbles of crystalline quartz were observed eroding from higher terrace deposits near 31Ch8 and are thus readily available.

Plate 22.3 illustrates the third core found in this stratum. Artifact 7·4·5·4 is a small (5.5 gm) fragment of high quality chert or chalcedony, the end product of bipolar reduction of a pebble possibly derived from Haw River gravel bed deposits. No edge damage other than crushing of flake origins and terminations is visible, nor are there any other indications that 7·4·5·4 was intended for use as a *piece esquille*. Bipolar lithic reduction techniques have been recognized from several sites in eastern North America, but usually in association with Early Archaic assemblages (Goodyear 1974; Chapman 1975, 1976, 1977) or in areas of low and raw material availability (Anderson 1979). Other Haw River specimens pertain to the first condition, but not the second. This example from 31Ch8 may extend the use of bipolar reduction techniques to periods well beyond the Early Archaic, keeping in mind the possibility of site disturbance or scavenging behavior.

III. Site Furniture:

Hammerstone/Abrader: specimen 2·4·5·3 is a broken cobble of locally-available reddish-brown quartzite with one battered end and an area of abrasion on one flat surface. No additional modifications are visible. This object functioned as a multi-purpose pounding/grinding tool, possibly for milling of seeds or other vegetable food sources.

Lamella 2 — Early/Middle (?) Woodland

The lithic tool assemblage from this stratum of 31Ch8 again contains a number of temporally diagnostic forms (Yadkin, Savannah River), but is dominated by other types that only rarely have been documented in the literature of Piedmont archeology. The hafted biface, or projectile point sample from Lamella 2 was comparatively less diverse than that of Lamella 3 (five versus nine recognizable types) and continues certain of those categories. However, diagnostic tool category membership is skewed heavily toward the Small Lanceolate and Stem-notched varieties (discussed earlier), rather than the large to medium-sized triangular point forms normally expected to occur on Piedmont Woodland stage sites (Coe 1952, 1964; Smith 1965; McCormick 1970; Wilson 1976). Again, despite possibilities of disturbance or contamination, the stratified Haw River site deposits indicate that considerably more diversity exists (even in terms of "style") within prehistoric tool assemblages than has been presented in the literature (Plate 23.7-11).

I. Personal Gear from Lamella 2 deposits at 31Ch8 consists of both ceramic and lithic artifacts assignable to Woodland stage occupations. Based on reductions in size, minor changes in hafting techniques, edge-wear patterns, and congruence with generalized trends of Southeastern prehistory, it seems reasonable to assume that many, if not most of the

"hafted bifaces" from this stratum are actually projectile if not actually arrow points. Some evidence will be presented which indicates that not all triangular points are projectiles, nor are stemmed or notched forms necessarily hafted knives (see also the discussion of Lamella 3 hafted bifaces).

Yadkin: four triangular point specimens from Lamella 2 were assigned to this category, following descriptions for Early/Middle forms described by Coe (1964:45-46). Similarities between the Yadkin Large Triangular and Roanoke Large Triangular Varieties (Coe 1964:110) are noted, but the former term is adopted here to maintain continuity with other investigations in the Jordan Reservoir area (Smith 1965; McCormick 1970; Wilson 1976).

However, as at the Roanoke Basin sites, large, crude triangular points (Badin) associated with Early Woodland occupations at the Doerschuk site (Coe 1964:45-46) were not found during our excavations at 31Ch8, with the possible exception of Item 4·5·2·1 from Stratum 1. Previous investigators of the 31Ch29/31Ch8 complex also have noted the rarity of Badin variety bifaces under identical circumstances of site formation and artifact recovery (McCormick 1970:32-37, 72; Wilson 1976:48).

Metric dimensions for lamella 2 Yadkin points are included below. All are of typical raw material (meta-volcanic felsite) except specimen 2·2·2·2 which is a finely-made point of seam quartz, banded alternately clear and milky. The latter item can confidently be regarded as a lost, rather than discarded tool, due to its symmetrical outline, sharp lateral edges and apiculate tip. Its symmetry is marred only by the loss of a small (1 mm) portion of one basal "ear" which could not have affected its utility as either a projectile or cutting implement.

Specimen	Length	Base Width	Thickness	Missing Portion	Reworked
2·2·2·2	66mm	24mm	8mm		
1·8·4·6	>40	24	19	tip	x
1·9·2·1	>30	24	9	tip	x
6·1·2·3	38		6	LL corner	

Small Stem-notched: eleven points were assigned to this category, including both rudimentary stemmed (n = 4) and stemmed/corner-notched (n = 7) varieties similar to those found in lamella 3. A tendency towards more definite haft element (tang) construction is present in the Lamella 2 sample although the "miniature Morrow-Mt." form still constitutes a significant portion of this category. Blade treatments within the group exhibit low variability, retaining the pattern of marginal pressure flaking and central median ridges (Plate 23.7-8). Blades are often asymmetrical (36 percent)

reflecting either resharpening of lateral edges or initial inabilities to form shoulders on small point forms. Definite edge wear is present on eight of the eleven specimens; haft element smoothing is found on only two. Metric dimensions on the points are included in Table 9.47.

As a group, the points labelled Small Stem-notched from lamella 2 show internal consistency in most dimensions. The sample includes narrow lanceolate to isosceles triangular blade forms, 28 to 47 mm long ($\overline{x}$ = 32) with short stems averaging slightly more than 8 mm in length. The neck width, which may be a general indication of related shaft diameters (Thomas 1976) averages 10.3mm. The smallest specimen, 7·1·5·15 is a crudely made stemmed or side-notched arrow point made of quartz. It was found within Feature 5, 31Ch8, a Woodland period storage/refuse pit which also contained major portions of two ceramic vessels. A charcoal sample from the feature was submitted to Beta Analytic, Inc., yielding a C_{14} date of 2190±95 B.P. (Beta-1357). The association of this point with the feature and ceramic sherds is felt to be reliable and should provide a temporal framework for identifying similar forms elsewhere.

The discussion of lamella 3 examples of the Small Stem-notched point type included comparisons with analogous Woodland forms in Tennessee (Lewis and Kneberg 1957). The type is known also from Piedmont sites, but has not been formally described or placed in definite statigraphic contexts. Woodall's analysis of artifacts from the Randleman Reservoir in Randolph and Guilford Counties, North Carolina, makes reference to at least two specimens of this Small Stem-notched type (Woodall 1977:56, 81, 143, 145). Single specimens were collected from sites 31Rd48 and 31Rd79; the former site produced other Late Woodland triangular point forms and ceramics while the second was identified as a possible Middle Archaic occupation on the strength of the single point. Similar point forms and site identifications have resulted from other Piedmont surveys (Keel and Coe 1970).

Perhaps the most confirmatory evidence for Early Woodland production of Small Stemmed points is found in Spielmann (1976). During the course of her investigations into Archaic stage settlement patterns in Forsyth County, North Carolina, Spielmann submitted several samples of Archaic and Woodland hafted bifaces to Dr. Joffre Coe for typological identification (1976:iv). In addition to the predictable Early Woodland forms called Badin, several small contracting stem and stemmed/notched points were identified from the Forsyth County collections as an alternative "Early Ceramic" form (Spielmann 1976:24, 25, Fig. 12). Dimensions of the Forsyth County specimens include: length — 35 to 58 mm ($\overline{x}$ = 47 mm) and width — 15 to 20 mm ($\overline{x}$ = 18 mm). Data provided by Spielmann and Coe thus confirm evaluations of the 31Ch8 specimens, substantiating the existence of point forms other than crude Badin Triangular types for at least Early Woodland occupations of this and other Piedmont sites.

Table 9.47
Small stem-notched point dimensions, lamella 2, 31Ch8

Specimen	Axial Length	Blade Length	Tang Length	Shoulder Width	Base Width	Neck Width	Thickness	Fracture Type
1·5·4·3	〉36mm	〉27mm	9mm	17mm	10mm	9mm	9mm	impact
2·6·4·4	55	47	8	17			7	
1·8·3·1	〉32	〉23	9	18	12	10	8	snap
1·8·4·4	46	38	8	18	12	10	8	
2·8·3·7	38	28	10	19			7	
2·9·3·5	〉29	〉21	8	18	8	8	8	snap
3·8·3·2	39	28	11	25			9	
3·8·4·1	37	31	6	21	10	9	7	
4·1·3·7	〉25	〉18	7	19	19	14	4	impact
4·2·3·2	43	38	5	16			8	
7·1·5·15	24	14	10	15	14	12	7	

Small Lanceolate: artifacts in this category conform to the descriptions provided for lamella 3 specimens. If anything, the examples from this stratum of 31Ch8 show even greater consistency in design/manufacture than did the items from the previous stratum. In addition, all four examples were excavated from a single 1m x 1m unit 15 cm deep of soil matrix that was later included as part of natural stratum 3. Furthermore, three of the four specimens from the fourth stratum were collected within the same unit, separated only by the clay lamella used to define occupation zones. The potential for vertical displacement of those artifacts only 5 cm and through the clay lamella cannot be ruled out; at any rate, the recovery of 87.5 percent of the total sample from only .2 m^3 of fill very definitely suggests the possibility of an artifact cache or at least a very tightly grouped cluster of functionally identical tool forms. Subsequent sections of this report will be directed toward exploring those and other spatial relationships of artifact groups in a more systematic fashion, but for now, the data at hand are quite informative. Dimensions of Small Lanceolate points follow.

Specimen	Length	Width	Thickness
2·6·2·5	54mm	16mm	10mm
2·6·2·4	45	15	10
2·6·3·3	50	16	10
2·6·4·2	49	16	9

Photographs of lamella 2 examples of the Small Lanceolate type, 2·6·4·2, may be found on Plate 23.10 and 23.11, along with one with from lamella 3, 31Ch8 (Plate 23.15).

Large Lanceolate: the second and third occupation zones of 31Ch8 sampled in the Block C excavations both produced two example of Large Lanceolate type bifaces. Both specimens from Lamella 3 and from this second stratum were obtained within the same general area (6 m^2) as the Small Lanceolate cluster noted above. Except for the variation in overall size, all point forms categorized as Large Lanceolate are morphologically identical to the smaller forms. The possible exception is 2·8·4·8 from this stratum, which exhibits the same outline but was not successfully thinned to the same dimensions as the others. A large "knot" remains on the proximal portion of one face. Otherwise, dimensions of all four Large Lanceolate types from Strata 3 and 4 are remarkably consistent. Specimen 2·7·3·1 is illustrated in Plate 23.9.

Specimen	Length	Width	Thickness
2·7·3·1	71mm	21	8
2·8·4·8	71	21	13*

*excludes flaw, as noted.

Savannah River Stemmed: a broad-bladed, stemmed point or knife was recovered from lamella 2 deposits that can be identified as a Savannah River Stemmed variant. This may be a later variant of the type, if general reduction of blade and tang dimensions are any indication of such a trend (see Smith 1965:75-84 and Spielmann 1976: Figure 11). Measurements of 31Ch8 Specimen 3·1·4·2 are: shoulder width — 30 mm; tang width — 20 mm; base width — 18 mm; tang length — 21 mm; thickness — 10 mm. No blade measurements are possible due to a transverse fracture, but straight edges and a biconvex cross-section closely resemble other Savannah River Stemmed points described from this site.

Hafted Biface Fragments: point fragments from lamella 2 include three distal point fragments (2·2·2·1, 2·6·2·9 and 4·7·4·4) and two miscellaneous fragments (6·1·2·1 and 5·8·2·3). Specimen 2·2·2·1 shows extensive damage from use and/or burning and may be part of a non-hafted biface. Number 5·8·2·3 is a crudely formed arrow (?) point made by retouching a very thin (2 mm) flake. The remaining specimens in this category appear to be portions of triangular arrow points or equally small bifacial artifacts.

Bifaces: twenty-one whole or broken bifaces were found in lamella 2 deposits of 31Ch8, distributed as follows: whole — 10; distal fragments — 5; and proximal fragments — 3. Only one reconstructable biface was found in this stratum, involving fragments 4·8·4·1 and 4·3·3·4, recovered slightly over 2m apart in EU4 of Block C.

Table 9.48 presents dimensions and other information on the Lamella 2 biface sample.

Lamella 2 biface manufacture categories occur in roughly equal proportions to the lamella 3 sample, although on the whole, average dimensions within each class are diminished in the lamella 2 collection. Edge damage is more frequent in all classes and breakage appears to be more patterned; 42 percent of the lamella 2 bifaces exhibit transverse blade breaks (Plate 22.5) while 31 percent of the lamella 3 sample show such breakage.

Definite manufacturing trajectories are present in lamella 2 bifaces. While a certain portion of the lamella 3 sample was intended for production of Savannah River Stemmed points, the present group contains whole and fragmented portions of lanceolate bifaces very similar to the point forms called Small and Large Lanceolate (see previous discussion). Specimens 5·1·2·2 and 9·2·4·2 (Plate 22.6 and 22.7) illustrate this process; the edge damage noted for such specimens may be platform preparation rather than actual wear (Sheets 1973). The reassembled Specimen 4·8·4·1/4·3·3·4 perfectly mirrors the morphology of smaller lanceolate forms termed hafted bifaces, except for its considerably greater size.

What is suggested by much of this biface collection, then, involves carefully planned production and possible storage/transport of distinctive straight based, parallel-sided

Table 9.48
Data on Bifaces From Lamella 2, 31Ch8

Biface Category	Condition	Shape	Length	Width	Thickness	Weight	Edge Damage
Immediate Manufacture							
1·1·4·7	whole	ovate	59mm	26	16	26gm	X
2·7·3·2	whole	ovate	76	31	27	49	X
7·9·5·2	broken			29	13	46	
Intermediate							
2·9·4·7	whole	ovate	42	28	15	16	X
2·9·3·6	whole	triangular	47	28	20	19	X
3·9·4·6	whole	lanceolate	46	21	13	11	
5·1·2·20	broken			66	17	33	X
Tertiary							
1·5·4·1	whole	lanceloate	39	21	9	6	
5·1·2·2	whole	ovate	66	31	17	33	X
9·2·4·2	whole	lanceolate	64	23	14	16	X
4·8·4·1/4·3·3·4	whole	lanceolate	87	28	14	48	X
1·3·4·2	broken			44	8	10	X
1·4·3·2	broken				8		X
2·6·4·3	broken			27	10		X
5·6·3·12	broken			24	8		X
2·3·2·3	broken			28	11		X
5·2·3·3	broken			20	8		X
Miscellaneous							
5·6·3·1	broken			22	10		X

(lanceolate) biface forms at 31Ch8. If our identification of a staged manufacturing process is correct, then similar forms should occur at other Woodland sites along the Haw River and other major stream valleys in the region. Distributional studies of these forms will aid in the identification of contemporaneous site occupations and facilitate interpretation of Woodland settlement/subsistence patterns.

Drill: a distinctive Woodland stage drill or perforator was found in lamella 2 deposits, associated with the other tools described here. Artifact 9·3·4·3 is formed from a scavenged flake of dark grey latite porphyry (Plate 22.2). A projection 15 mm long and tapering from 12 mm to 2 mm in width was created by bifacial flaking and subsequent use of the tool for boring or drilling operations. Numerous small step fractures along the edges of the projection lend further evidence to this interpretation. Generally similar forms are reported by Coe (1964:49-50) for Late Prehistoric (Caraway) occupations of the Doerschuk site and at least one analogue was excavated from similar contexts at 31Ch29 by Wilson (1976:53) (see also Specimen 7·9·1·1 from Lamella 1, 31Ch8).

II. Situational Gear: unlike most other occupation zones at the Haw River sites, the expedient tool category from lamella 2, 31Ch8 consists mainly of purposely modified flake tools rather than simple "utilized" or edge-damaged flake tools. But while relative proportions of the two use/manufacturing categories vary between strata 2 and 3, these forms are a minor element of the entire second stratum assemblage. As discussed previously, production and use of bifacial tools appears to have dominated lithic artifact needs during Woodland stage occupations at 31Ch8.

Retouched Flakes: six flakes modified by marginal unifacial or bifacial flake removals are included in this category, divided between four scavenged and remodified flakes of andesitic felsite, a retouched amorphous "chunk" or core fragment (6·3·2·5) and a crudely retouched FBR (6·3·2·4). The first four artifacts share common attributes of large size, raw material, patinated original flake surfaces and secondary removal of marginal flakes to produce uniform (2) or serrated edges. Given the presence of Late Archaic tools of similar appearance in lower levels of the site, it is reasonable to postulate that artifacts 2·5·4·5, 2·6·3·4, 3·9·4·5 and 4·6·4·2 are additional examples of Woodland scavenging and re-use of older materials.

Dimensions of retouched flake tools from Lamella 2 are provided in Table 9.49 below.

Table 9.49
Data on Purposely-modified Flake Tools, Lamella 2, 31Ch8

Specimen	Max. Length	Max. Width	Max. Thickness	No. Modified Edges	Edge Locations
2·5·4·5	60mm	44mm	14mm	2mm	RL, LL
2·6·3·4	42	21	3	2	RL, LL
3·9·4·5	40	86	23	2	RL, D
4·6·4·2	47	30	33	2	RL, D
6·3·2·5	58	35	31	3	RL, LL, D
6·3·2·4	21	21	2	2	RL, LL

Edge-damaged Flakes: only two flakes from the lamella 2 sample showed evidence of cursory use as light-duty cutting or scraping tools. Artifact 3·5·4·8 is a long (90 mm), acutely-edged flake with discontinuous areas of nibbling along the right lateral and distal edges. Specimen 4·3·4·8 is a fragmented FBR with similar edge damage along a 13 mm portion of the distal end.

Core: artifact 6·6·2·2 is a large, multi-directional core of porphyritic andesite, the only representative of this category found in lamella 2. Like certain of the flake tools discussed above, this may represent an Archaic artifact salvaged and further modified by later site occupants. Differential patination of flake scars lends support to that hypothesis. Dimensions of item 6·6·2·2 are: length — 76 mm; width — 69 mm; thickness — 43 mm; and weight — 235 gm.

III. Site Furniture:

Anvil/Hammerstone: an oval sandstone cobble (1·3·4·5) weighing 440 gm shows evidence of use as a combination anvil and hammerstone. (Plate 19). Pitted areas 12 mm x 19 mm and 33 mm x 23 mm are visible on obverse and reverse sides of the naturally flattened cobble, as well as more generalized battering or abrasion on several marginal areas. Several functional interpretations have been proffered for similar artifacts from Paleo-Indian (MacDonald 1968) through historic Eskimo (Binford 1978a) assemblages. Spears (1975) has experimentally determined that pitted cobbles can be produced as secondary artifact forms during activities as diverse as cracking nuts or bipolar lithic reduction. Obviously, accurate interpretations of the function of this single specimen from 31Ch8 must remain equally general.

Stratum 1 — Woodland/Protohistoric

This occupation zone of 31Ch8 is labelled stratum, rather than lamella like previous divisions, because it was defined more on the basis of soil color and textural changes than on the presence of a clay-charged lamella marking separate alluvial sequences. Disturbance processes, both natural and cultural, have been more directly effective in mixing site deposits of Stratum 1 than those of lower site strata; therefore, interpretations of artifact associations and distributions must be made only with great discretion.

Several diagnostic artifact forms, both lithic and ceramic, were found in Stratum 1 and generally serve to identify later Woodland stage occupations of the 31Ch8 area. Presence of earlier artifact forms in Stratum 1 serve as reminders of the active disturbance processes at the site, however.

I. *Personal Gear* and the more expedient tool forms labelled Situational Gear exhibit greater diversity of form and, possibly, function than assemblage samples from earlier occupation zones. The number of artifacts increases, as do potential subdivisions of the several classes of bifacial and unifacial tools. Middle to Late Woodland artifact styles, especially triangular points, are well represented and indicate substantial use of the site during later Woodland times as well as the collapsing of at least 800 to 1000 years of prehistoric occupations into a soil zone averaging 15 to 20 cm thick.

Hafted Bifaces: eight varieties of projectile points or hafted bifaces were segregated within the Stratum 1 collection, including five previously-described triangular forms that make up 75 percent of the total number of identifiable points. Distribution of those artifacts is as follows: Uwharrie — 9; Yadkin — 9; Badin — 1; Caraway — 6; Pee Dee — 1; Small Stem-notched — 7; Small Lanceolate — 1; Miscellaneous — 3.

1. Uwharrie: as noted by other investigators of the Haw River sites, Uwharrie type arrow points are a majority element of surficial Woodland site deposits (McCormick 1970; Wilson 1976). Five whole and four broken examples of the type were found in Stratum 1 deposits at 31Ch8, and were identified following descriptions provided by Coe (1952:308), Smith (1964:102-104) and Wilson (1976:50). All share the typical isosceles triangle outline, although at least three blade edge treatments were noted. Only one specimen (9·2·1·5) has straight edges, three exhibited incurvate, resharpened blades and the remainder (5) have slightly serrated edges (Plate 23.1 and Table 9.50). All are made of meta-volcanic raw materials.

Table 9.50
Dimensions of Uwharrie Points, Stratum 1, 31Ch8

Specimen	Length (mm)	Base Width (mm)	Thickness (mm)	Edge Outline	Missing Portion
1·1·1·3			3	Serr.	tip, corner
2·9·1·1	29	25	7	Incurv.	
4·6·1·2		21	5	Serr.	tip, corner
7·1·3·5	17	25	4	Incurv.	corner
9·2·1·5	23	24	5	Straight	
9·3·1·7	22	20	4	Incurv.	
7·6·1·6		19	3	Serr.	tip
9·4·1·1			4	Serr.	tip
7·8·3·6	27	19	4	Serr.	

Given the high proportion of broken specimens (56 percent) and frequency of resharpening (33 percent), it is fair to assume that the Uwharrie points from Stratum 1 were discarded after removal from arrow shafts rather than lost intact.

2. Yadkin: these arrow (?) points are characteristically larger in all dimensions than Uwharrie varieties and are interpreted as temporally precedent Woodland forms (Coe 1964:45-49,55). Like the Uwharrie sample from this same stratum, Yadkin points conform to published descriptions but exhibit a range of variability due to manufacturing stages, breakage and reworking patterns. Only one of the nine Stratum 1 Yadkin points was recovered in an unbroken state; interestingly, artifact 4·8·3·5 exhibits pronounced smoothing and rounding of all edges, including the distal point (see also specimen 4·8·4·3 from Lamella 3 deposits). Wear patterns of this item and others from 31Ch8 indicate that Yadkin "points" may have functioned also as cutting tools during some portion of their life histories, a fact borne out by specimen 4·8·3·6, which has been modified into a (well-worn) drill/borer.

   Breakage patterns of Yadkin points include three transverse blade breaks of finished points (Plate 23.4, 23.5) and two instances of corner breaks. One of the latter events occurred during attempts to finish a point, when an overshot bifacial thinning flake carried across the tool face and removed the opposite corner. Other instances of manufacturing flaws are present in specimens 7·2·3·4 (incomplete bifacial thinning) and 3·9·1·5/5·4·1·11 (reconstructed from a broken, thick preform). Two other Yadkin points were reconstructed from separate fragments, but appear to be finished specimens. Reassembled artifacts are marked in Table 9.51 with asterisks (*).

Table 9.51
Data on Yadkin Points From Stratum 1, Block C, 31Ch8

Specimen	Length	Base Width	Thickness	Breakage
3·8·1·1/3·7·1·2*	47mm	34mm	6mm	transverse
4·8·3·5	54	25	6	corner
4·8·3·6	45	23	5	reworked
7·2·3·4		24	10	incomplete
7·9·2·1		27	6	transverse
3·9·1·5/5·4·1·11*	57	26	12	transverse
8·7·2·2		24	4	transverse
8·8·3·2/7·4·5·1*	36	24	4	corner
2·2·1·3	38		8	corner

3. Caraway: assigned to this Late Woodland category are small, isosceles or equilateral triangular points (Plate 23.6) resembling those described and illustrated by Coe (1964:48-49). More equilateral specimens (n = 3) might also be classified as Hillsboro variants, but the condition of most specimens precludes more accurate identifications. Three of the six Late Woodland arrow points are made of quartz, contrary to more frequent selection of meta-volcanic materials for point construction. Breakage patterns for Late Woodland points from Stratum 1 are indicated in Table 9.52 no incomplete or unfinished examples were recovered.

Table 9.52
Data on Caraway Points From Stratum 1, Block C, 31Ch8

Specimen	Length (mm)	Base Width (mm)	Thickness (mm)	Breakage
6·1·1·14			4	transverse
6·3·1·16	20		6	corner (2)
6·9·1·1	20	14	5	
9·2·1·4			4	tip, corner (2)
7·5·3·3	18	13	5	
9·6·2·1			3	tip, corner

4. Pee Dee Pentagonal: the distinctive pentagonal outline of specimen 8·1·2·5 permits identification of this Late Woodland or Mississippian point variety (Coe 1964:49). The large size and pronounced edge wear on this artifact suggest that it was used as a cutting implement, perhaps to the exclusion of functioning as a projectile point. Dimensions of 8·1·2·5 are: length — 37 mm; shoulder width — 31 mm; base width — 19 mm; thickness — 7 mm.

5. Badin: the single (possible) example of this Early Woodland biface type was found in Stratum 1 deposits. Artifact 4·5·2·1 is a thick, roughly lanceolate biface with recurved blade edges and a concave base. Grinding or wear is present on all edges, indicating that this item was used as a cutting implement rather than as a projectile. Dimensions of 4·5·2·1 are: Length — 51 mm; width — 21 mm; thickness — 12 mm.

6. Small Stem-notched: artifacts within this category exhibit considerably more diversity than samples from other levels, although basic continuities of haft and blade design persist (Plate 23.8). Four of the seven points labelled Small Stem-notched exhibit expanding tangs created by shallow side notches, while the remaining three have contracting stems. Specimen 6·1·1·10 is included in the latter variety, however, an exaggerated blade length (71 mm) and even edge wear patterns show that it functioned as a hafted knife rather than projectile point.

Table 9.53
Data on Small Stem-notched Points, Stratum 1, 31Ch8

Specimen	Length	Shoulder Width	Tang Width	Base Width	Thickness
2·2·1·2	38mm	16mm	11mm	11mm	8mm
4·2·1·5	50	23	13	19	7
5·1·1·3	44	20	15	9	9
6·1·1·10	〉74	19	12		9
6·2·1·12	31	16	12	10	7
4·8·1·8	33	14	10	11	7
6·8·1·2	24	15	11	12	6

7. Small Lanceolate: a simple example (Plate 23.3) of this type, again from EU2 (2·6·1·4). Displacement from an underlying cache or activity cluster is a definite possibility. Dimensions of the artifact are: length — 46 mm; width — 15 mm; thickness — 7 mm (compare above for lamella 2 specimens).

8. Miscellaneous: three point or hafted bifaces were collected from Stratum 1 that could not be placed within other categories. Artifact 1·1·1·2 is a thick, crudely made point or possible drill measuring 37 mm is length, 15 mm in maximum width and 9 mm thick. It may conform to published descriptions of either Bradley Spike (Kneberg 1956:27) or Randolph Stemmed (Coe 1964:49-50) varieties.

   Specimen 9·1·2·3 is a marginally retouched, thin flake of vitric tuff. Roughly shaped for use as an arrow point, it does not conform to any known point types.

The third miscellaneous point is a thick, crudely-stemmed variant and may be a scavenged Late or Middle Archaic specimen. Unpatinated fracture scars and the dimensions (length — ⟩ 46 mm; shoulder width — 29 mm; base width — 21 mm; tang length — 15 mm) suggest that specimen 8·8·3·1 may in fact be a re-used Archaic tool.

Hafted Biface Fragments: a dozen fragments of arrow points or other similar biface types were recovered from Stratum 1 deposits of 31Ch8. All twelve specimens are distal point fragments and range in weight from .2 gm to 2.1 gm. The point fragments were produced by transverse fractures of various point forms. No cultural-historical identifications are possible, but specimen 3·2·1·11 should be noted as one of the few artifacts recovered during the entire excavation program that is made from high grade cryptocrystalline chert. The artifact is translucent dark brown in color and exhibits fine pressure flaking along remaining blade edges. While artifacts made of possible non-local materials indicate some extra-regional contacts, positive identification of the source area is impossible.

Bifaces: the general category of non-hafted bifacial tools contains significantly fewer examples than were described for earlier occupation zones. Seven whole and seven fragmented bifaces were recovered from Stratum 1 and undoubtedly represent by-products of several periods of habitation. Table 9.54 contains provenience and metric data on those artifacts.

Stratum 1 bifaces are markedly smaller in all dimensions than those from earlier occupation zones. Few technological patterns can be observed in the sample, but several specimens confirm that production of smaller lanceolate bifaces (6·3·1·9, 8·2·1·5 and reassembled 3·4·3·1/ 3·2·4·3) remained a primary manufacturing trajectory during Late Woodland or protohistoric occupations. Specimen 8·9·2·1 also resembles unfinished Yadkin Triangular points discussed earlier and evidences early stage production of those tool forms.

Drill: the final tool placed within the organizational category of personal gear from Stratum 1, 31Ch8 is another example of a bifacially worked drill or boring implement (Plate 22.1). Two projections have been created by marginal reworking of a thin flake. The more prominent bit element measures 23 mm in maximum length and tapers from 13 mm to 1 mm in width. The second projection measures only 2 mm in length and is situated on a "corner" of specimen 7·9·1·1. Wear on both tool elements includes generalized polish of flake ridges; the outline of the artifact (basically triangular) conforms to the morphology of Yadkin Triangular points and may serve to identify its period of manufacture and use.

II. Situational Gear: a predictably variable complement of expedient tool forms were recovered from Stratum 1 deposits, including 12 retouched and 11 edge-damaged flakes. Table 9.55 includes data on the provenience and attributes of both tool categories.

Retouched Flakes: information provided in Table 9.55 for Stratum 1 expedient tools documents a heterogeneous collection of flake types, sizes and tool types. Missing data for many specimens indicates breakage that precluded measurement of basic dimensions. Comparison with the edge-damaged flake tools demonstrates selection for larger flakes averaging 33.4 mm long (n = 5), 24 mm wide (n = 9) and 9.4 mm thick (n = 12). Purposely-modified flakes include mainly large FBR's or Indeterminant (broken) types. Edge modification was confined to portions of one or two edges in most cases, although specimen 6·2·1·11 has been reworked on all margins to produce a multi-functional cutting/scraping/piercing tool.

Edge-damaged Flakes: broken (Indeterminant) or FBR flake types comprise the total sample of edge-damaged flake tools from Stratum 1 of 31Ch8. Two notable specimens include 7·2·3·8 and 8·1·1·3. The former is a miniature endscraper made of clear quartz crystal, while the second specimen is a triangular fragment of translucent dark brown chert used as a pointed piercing or graving tool. All other specimens are incidental cutting or scraping tools, probably used for one or two simple activity cycles before being discarded.

Core: a large boulder fragment of andesitic felsite shows evidence of two massive flake removals. No edge wear is present and artifact 6·2·1·15 is interpreted as an incidental raw material source for production of other flake or biface tools. The specimen measures 85 x 101 x 38 mm and weighs 320 gm.

III. Site Furniture:

Cobble Tools: Plate 19 illustrates cobble tool forms found in Stratum 1 of 31Ch8. Specimen 7·3·1·2 is a flattened river cobble of dense sandstone or quartzite weighing 640 gm. It bears a depression 20-25 mm in diameter and 1-2 mm thick on one face and probably corresponds to the anvil/hammerstone tool type discussed for a similar specimen in the lamella 2 assemblage.

Artifacts 5·4·1·7 and 5·9·1·15/5·3·1·5 are subrectangular cobbles of dense sandstone weighing, respectively, 618 gm and 316 gm. The first exhibits two flattened/abraded surfaces and undoubtedly functioned as a milling stone. The second consists of two fragments of a surface abraded milling (?) stone which also has a broad shallow pit (25 x 25 x 3 mm) on one face. No striations are visible within the pitted area, but heavy pounding was undoubtedly part of the tool's function, since it was broken cleanly through the center of the depression. Clearly a multipurpose grinding/pounding role was filled by this specimen.

Table 9.54
Data on Bifaces From Stratum 1, Block C, 31Ch8

Biface Category	Condition	Shape	Length	Width	Thickness	Weight	Edge Damage
Immediate Manufacture							
9·3·3·4	whole	triangular	34mm	25mm	7mm	5gm	X
3·4·1·10	broken	oval	22	29	13	10	X
3·5·1·7	broken		22	22	9	3	
Intermediate							
5·2·1·6	whole	ovate	40	27	11	11	
6·3·1·9	whole	lanceolate	47	20	10	10	
8·2·1·5	whole	triangular	47	23	12	9	
8·9·2·1	whole	rectangular	37	25	7	6	
3·4·3·1/3·2·4·3	whole	ovate	50	28	10	16	
6·4·1·8	broken			35	8		X
7·5·3·2	broken			25	3		X
3·4·1·2	broken			21	10		X
Tertiary							
6·8·1·3	whole	lanceolate	37	17	13	6	X
Miscellaneous							
4·1·1·3	broken				8		X
3·8·1·9	broken				6		X

Table 9.55
Data on Expedient Flake Tools, Stratum 1, Block C, 31Ch8

Tool Category	Max. Length (mm)	Max. Width (mm)	Max. Thickness (mm)	No. Modified Edges	Edge Locations	Flake Type
Retouched						
1·3·1·7			7	1	RL	Ind.
3·6·1·14	20	11	5	1	D	FBR
3·6·2·3	59	50	16	1	P	CR
3·8·1·17		33	6	1	RL	FBR
4·3·1·1		15	12	1	D	Ind.
5·2·1·2		10	7	1	D	Ind.
6·1·1·13	36	28	10	2	LL, RL	CR
6·2·1·11	19		11	5	all margins	Ind.
5·8·1·16	33		10	2	D, RL	Ind.
6·9·1·17		11	2	2	RL, LL	PF
7·4·5·10		25	11	3	RL, LL, D	PF
8·4·2·4		34	16	3	RL, LL, D	Ind.
Edge-damaged						
3·5·1·8	23		4	1	RL	Inc.
2·8·1·5	15	15	3	2	RL, LL	FBR
3·7·1·4	20	30	6	1	RL	Ind.
5·1·1·4	39	48	3	3	RL, LL, D	Ind.
6·7·1·18		25	8	1	Ind.	Ind.
7·2·3·8		20	4	1	D	FBR
7·3·1·20	8		2	3	RL, LL, D	Ind.
8·1·1·3		16	4	2	LL, D	Ind.
8·3·1·6	22		4	1	Ind.	Ind.
7·9·2·10	29	23	4	2	RL, D	FBR
8·7·3·3	30		8	1	RL	Ind.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